

# Impact of COVID-19 on Stock Market: A Systematic Literature Review and Directions for Future Research

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## Abstract

This paper aims to systematically review research on the impact of Covid-19 in stock market and identify gaps for further research. Following the emergence of Covid -19 in China and its incredible speed in crossing borders, the stock market suddenly felt intense pressure on a global scale. This attracted the attention of researchers across the globe on Covid-19's impact on the stock market. Preponderance of research were conducted worldwide on various aspects of Covid-19 and its effect on industries and stock market. Despite the fact that there have been several studies on the stock market, the researcher found that the existing body of knowledge lacks systematic review of available literature.

In order to conduct a systematic evaluation of the literature, 103 research papers that were published in reputable journals between January 1, 2020, and June 30, 2021, were examined.

Detailed analysis of literature reveals that most of the research work focused on stock market return during the influence of Covid - 19 (i.e., 60 per cent of studies) and concentrated on United States of America's (USA) stock market (24.3 per cent). There is a dearth of studies on investor's behavior and stock market spillover effects during the pandemic environment. Furthermore, event studies on shocking news like number of covid cases, first case in the country, lockdown dates etc. were examined. But good events like retreat of lockdown, development in vaccination, falling Covid cases, government supports on specific industry and many more were not examined. Similarly, the casual relationship between commodity market and stock price was also not explored enough. Till date the review on Covid's impact on the stock market has received little attention. This paper examined substantial number of research papers firstly, to understand how Covid-19 affected the stock market. And secondly, identifying the research gap in the current field of knowledge.

To the best of the researchers' knowledge, there has never been a published systematic review of literature on covid's impact on the stock market. Researchers, portfolio managers, and policymakers can use this report

to get a sense of this topic's unexplored potential

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

### **Introduction**

Since the beginning of 2020, Covid-19 pandemic wreaked havoc on stock markets around the world as a result many experts were interested in learning more about how the pandemic will affect different sectors. The COVID-19 poses an unprecedented threat to public health, food systems, and the workplace. Above all, it has resulted in a significant loss of human life around the world. The epidemic has severely damaged the social system and economy. The economy and stock market were not immune to the Covid-19, which hammered the economy back to many years low. Furthermore, it has had a significantly greater impact on the stock market than the recent financial crisis. The advent of rapid spread of the virus across the world and its fear in public led to government intervention in the people's movement by shutting the international borders and introducing nationwide curfews. Due to these preventive measures adopted by governments led to halt of various economic activities. More importantly, the excessive degree of panic wiped away the investors' confidence. Hence, the stock market accelerated with reverse gear. After a few weeks, the market started to come back with the hope of vaccination development and covered the losses within few days. Moving further, the market soared to the sky and set the new historical high repeatedly.

Though all countries have been affected by the pandemic, the response to the Covid-19 and standard operating procedure differ from country to country. However, the stock market all over the world reacted unanimously by going down at the initial stage and gaining upward momentum with the hope of vaccinations. Consequently, in the year 2020 the stock markets completed one full swing. This piqued the interest of academicians and researchers who wanted to learn more about Covid's impact on the stock market. Several studies on the impact of covid on stock price have been published in recent years. However, there is no research that specifically focuses on systematic review of literature exploring the untapped areas in this subject matter.

### **Objectives of the study**

In the field of medicine, academicians, and researchers all over the world started to explore the vaccine for the Covid. During the same time, researchers, and academicians in the field of economics and finance started to explore the impact of Covid-19 in the stock market and published various research articles within a short span of time. However, there is no sys-

tematic review of literature on how the stock markets observed the COVID-19 shock. Hence, this study attempts to provide an extensive literature review on the Covid-19's impact on the stock market. More particularly, objective of the study is to organize the existing literature in an orderly manner as per their methodology and approaches to identify the research gap. This study, on the other hand, makes no attempt to give investment ideas that were investigated during the covid epidemic. However, it helps to understand the research methodologies used to investigate the Covid-19's impact on the stock market.

### **Methodology of Literature Review**

In this study, as suggested by Palmatier et al (2018), the systematic approach has been used for selecting the research articles for review. In the first step, research articles which studied the covid-19 impact on stock market searched in the selected publisher's databases. For that, researchers used a key term as "Covid-19 and Stock Market" in publishing companies' websites such as Elsevier, Emerald, Springer, Sage and Taylor and Francis. After that, we included only peer-reviewed articles published in the journals to assure the quality of the articles chosen for review. To filter down the literature even more, the keyword search was limited to certain topics of the journals published in the areas of Accounting, Finance, Business, Management, and Economics. The key word search was considered for the period from 01/01/2020 to 30/06/2021, as the Covid-19 were first reported in Wuhan City, Hubei Province, China on December 31, 2019.

Moreover, we considered only the articles with full text for the review. Finally, after perusal of the abstracts and content, researchers rejected the papers that were not relevant to the topic under study. This decreased the number of articles to 103 for further examination. Details of the elimination process is reported in Table - 1 and Table -2.

**Table 1: Database Search Protocol**

Date accessed on	Scope	Time Horizon	Search Term	Publisher	Final number of articles after initial scrutiny
06/08/2021	Title / Abstract / Keywords	01/01/2020 to 30/06/2021	COVID-19 and Stock Market	Science Direct Elsevier	55

06/08/2021	Title / Abstract / Keywords	01/01/2020 to 30/06/2021	COVID-19 and Stock Market	Sage	6
09/08/2021	Title / Abstract / Keywords	01/01/2020 to 30/06/2021	COVID-19 and Stock Market	Springer	16
09/08/2021	Title / Abstract / Keywords	01/01/2020 to 30/06/2021	COVID-19 and Stock Market	Taylor and Francis	16
23/07/2021	Title / Abstract / Keywords	01/01/2020 to 30/06/2021	COVID-19 and Stock Market	Emerald	10

Source: Authors' Compilation

**Table 2: Step by Step Process followed for selecting papers from peer reviewed journal**

Step	Constraint	Number
<b>Elsevier/ ScienceDirect Publications</b>		
<b>Step 1</b>	Key word	2815
<b>Step 2</b>	Subject Constraint	228
<b>Step 3</b>	Keyword search in Title/Keyword/Abstract	211
<b>Step 4</b>	After reading the Articles	55
<b>Sage Publication</b>		
<b>Step 1</b>	Key word	743
<b>Step 2</b>	Subject Constraint	741
<b>Step 3</b>	Keyword search in Title/Keyword/Abstract	48
<b>Step 4</b>	After reading the Articles	6
<b>Springer Publication</b>		
<b>Step 1</b>	Key word	4090
<b>Step 2</b>	Subject Constraint	1245
<b>Step 3</b>	Keyword search in Title/Keyword/Abstract	124
<b>Step 4</b>	After reading the Articles	16
<b>Emerald</b>		

<b>Step 1</b>	Key word	1342
<b>Step 2</b>	Subject Constraint	45
<b>Step 3</b>	Keyword search in Title/Keyword/ Abstract	13
<b>Step 4</b>	After reading the Articles	10
<b>Taylor and Francis</b>		
<b>Step 1</b>	Key word	3547
<b>Step 2</b>	Subject Constraint	873
<b>Step 3</b>	Keyword search in Title/Keyword/ Abstract	41
<b>Step 4</b>	After reading the Articles	16

Source: Authors' Compilation

**Table 3: List of Articles published by Journals on impact of Covid-19 on Stock Market**

<b>S. No.</b>	<b>Journal Name</b>	<b>Number of Articles</b>
1	Annals of Data Science	1
2	Applied Economics	2
3	Applied Economics Letters	4
4	Applied Economics Letters	1
5	Asia and the Global Economy	1
6	Asia-Pacific Financial Markets	1
7	Asia-Pacific Journal of Accounting & Economics	1
8	Asian Journal of Economics and Banking	1
9	Borsa Istanbul Review	2
10	Cogent Business & Management	1
11	Economic Analysis and Policy	3
12	Economic Change and Restructuring	1
13	Economic Modeling	1
14	Economic Research-Ekonomska Istraživanja	3
15	Environmental Science and Pollution Research	2
16	Finance Research Letters	27
17	Financial Innovation	4
18	Frontiers of Business Research in China	1
19	Global Business Review	1
20	Global Economic Review	1
21	Health Communication	1
22	International Review of Economics & Finance	1

23	International Review of Financial Analysis	4
24	International Review of Financial Analysis,	1
25	Islamic Economic Studies	1
26	Journal of Air Transport Management	1
27	Journal of Asset Management volume	1
28	Journal of Behavioral and Experimental Finance	2
29	Journal of Big Data	1
30	Journal of Business Research	1
31	Journal of Chinese Economic and Foreign Trade Studies	2
32	Journal of Chinese Economic and Foreign Trade Studies,	1
33	Journal of Economic Studie	1
34	Journal of Economics and Business	2
35	Journal of International Financial Markets, Institutions and Money	1
36	Journal of Public Economics	1
37	Journal of Tourism Futures	1
38	Macroeconomics and Finance in Emerging Market Economies	1
39	Millennial Asia	2
40	Pacific-Basin Finance Journal	2
41	Physica A	1
42	Post-Communist Economies	1
43	Quality & Quantity, 2020	1
44	Research in International Business and Finance	3
45	Review of Behavioral Finance	3
46	Risk Management	1
47	SN Business & Economics	1
48	SN Computer Science	1
49	Technological Forecasting and Social Change	1
50	The Indian Economic Journal	1
51	Tourism Economics	1
52	Vision The Journal of Business Perspective	1

Source: Author's Compilation

Table 3 exhibits the number of articles mentioning the impact of Covid - 19 on the stock market that have been published in each journal. This aids in determining which journals are most interested in the topic of COVID -19's stock market influence. In total, 52 journals have been published the articles about the COVID -19 impact on the stock market. Finance Research

Letters alone has published 27 research articles during the study period. There are several journals that have published only few article on COVID - 19 stock market implications during the period of study.

### 3. Articles by Research Methods

In this literature review, the selected articles were categorized based on different models employed to examine the impact of Covid-19 on the stock market around the world. Such categories are - 1. Econometric model; 2. Finance models and 3. Other models. Application of statistical tools to test economic theory is an econometrics model whereas financial models test the performance of financial assets.

ARCH, GARCH, Panel Data models and Regression analysis extensively used to identify the impact of Covid on the stock market across the globe. In finance models, Capital Asset Pricing Model (CAPM), Fama-French model, and Event studies were also used to test the performance of equity assets during the pandemic. Eight studies employed computer program-based models like Artificial neural network (ANN), Long-Short Term Memory (LSTM), Complex network method, Text analysis and wavelet coherence analysis. Most of these models were run in Python or R. Table 4 shows the number of research articles that used various models.

**Table 4: Number of Articles by Research Methods**

Research Methods	Name of the Models	Number of Articles
Econometric Models	Correlation, Regression, ARCH, Panel Data, VECM, GARCH, Markov Switching Model, Granger Causality etc.	80
Financial Models	CAPM, Fama-French, Event Study, Sharpe Ratio, Hendrickson and Merton, Gordon Valuation Model, Value at Risk (VaR)	15
Others	Artificial neural network, Long-Short Term Memory (LSTM), Complex network method, Text analysis, wavelet coherence analysis	8

Source: Authors' Compilation

### 4. Analysis by Industry Studied

Table 5 shows that around 80 percent of the studies i.e., 82 articles, considered the stock index data for their research whereas only eleven studies explored the impact of Covid on a selected group of individual firms. Though covid dragged the market to many years low, the amount of pain

was not similar across industries and different companies. Notably, tourism, aviation, and transportation industries were badly hit, and it took a long time to recover due to government restrictions and travel bans. On the other hand, pharmaceutical industry and information tech firms quickly recovered from the Covid wounds (Smales, 2021). Hence, it is warranted to explore industry wise and company wise also. However, availability of data and time might be the reason for the smaller number of studies on the impact of Covid-19 in individual firms and at different industries. This gives lots of scope for further analysis on Impact of covid on different industries.

**Table 5: Percentage analysis of Industry/ Index data covered in articles**

<b>Industry/Index</b>	<b>Number of Articles</b>	<b>Percentage</b>
Index	82	79.61
Individual Firms	11	10.68
Industry	8	7.77
Others	2	1.94

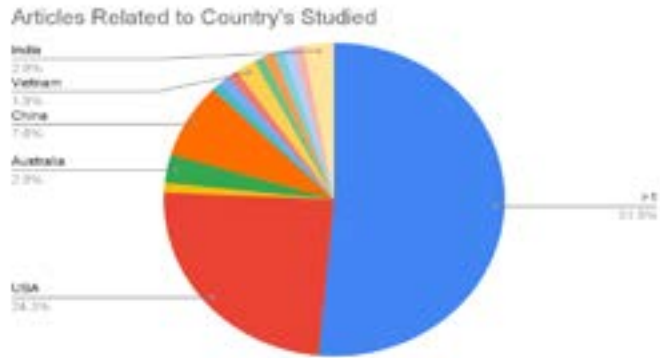
Source: Authors' Compilation

### **5. Percentage Analysis of articles covering Country by Country**

Fig - 1 indicates that around 51.5 percent of the articles analyzed the impact of Covid-19 on stock market in more than one country. These studies compared different markets. The details of authors who studied more than one country are exhibited in Table 6. However, from these research papers we were unable to infer the reasons why different countries were affected differently with any strong statistical support.

In addition, 24.3 percent of research papers focused solely on the impact of covid on stock market performance in the United States of America. Even though China is Covid - 19's initial hotspot, only 7.8% of the articles focused on Chinese stock market. Studies which explored the Australian and Indian markets is around 3 percent respectively. Earlier literature not attempted to explore the emerging economy's stock market reaction with Covid-19. This opens more possibilities for studying Covid's influence in emerging markets.





**Figure 1: Articles Related to Countries Studied**

Source: Authors' Compilation

**Table 6: List of authors who studied more than one country**

Author.	No of countries studied
Abdullahi (2021)	11
Aggarwal et al (2021)	12
Alaoui et al (2021)	6 Middle East and North African
Altig et al (2020)	UK & USA
Amine et al (2020)	6
Ashraf (2020)	64
Aslam et al (2020)	56
Aslam et al (2021)	3
Cepoi (2020)	6
Chiah and Zhong (2020)	37
Chien, F., et al (2021)	China, USA, Europe
Das, N. M., & Rout, B. S. (2021)	5
David et al (2021)	11
Engelhardt et al (2021)	47
Erdem O (2020)	75

Espinosa-Méndez and Arias (2021)	5
Fernandez-Perez et al (2021)	63
Florian Arendt and Manina Mestas (2021)	58
Hanif et al (2021)	US Vs China
Harjoto et al (2021)	86
Hasnaoui, J.A., Rizvi, S.K.A., Reddy, K. (2021)	16
Heyden and Heyden (2021)	17
Jiang et al (2021)	17
Karim et al (2021)	5
Kizys et al (2021)	72
Lai and Hu (2021)	20
Li et al (2020)	3 France, UK and Germany
Li et al (2021)	3
Lyócsa et al (2020)	10
Maneenop and Kotcharin (2020)	9
Mustafa et al (2020)	6
Narayan et al (2021)	G7
Nguyen et al (2021)	G7 & BRIC
O'Donnell et al (2021)	6
Okorie and Lin (2021)	32
Omane-Adjepong and Alagidede (2020)	6 African Markets
Pandey and Kumari (2021)	49
Prasenjit et al (2021)	20
Saleem, A (2022)	SAARC
Salisu et al (2020)	24
Seven and Yilmaz (2021)	78
Singh B, Dhall R, Narang S, Rawat S (2020)	G20
Størdal et al (2021)	Norway and Sweden
Takyi and Bentum-Ennin (2021)	13 African Countries
Topuc and Gulal (2020)	26
Uddin et al (2021).	34

Verma et al (2021)	10
Wang et al (2020)	19
Xu (2021)	USA Vs Canada
Yousfi et al (2021)	USA Vs China
Zaremba et al (2020)	67
Zaremba et al (2021)	67
Zhang and Hamori (2021)	USA, Japan, German
Zhang et al (2020)	12

Source: Authors' Compilation

Zhanga et al (2021) studied the correlation among different country's stock market during the Covid 19 outbreak. They found that the USA stock market failed to take the lead role in the world of capital market. They also found that the Asian markets have been integrated than the European stock markets. Zaremba et al (2020) demonstrated that government interventions significantly and robustly increased the volatility in international stock markets. Erdem (2020) found that stock markets of less regulated countries are affected intensively. Gulal and Topcu (2020) results proved that Asian markets felt more pain than the European emerging markets during the Covid-19. They also found the weak evidence for volatility spillover effects during the pandemic period. Subramaniam and Chakraborty (2021) constructed COVID-19 fear index using the search terms related to the corona pandemic then they applied the OLS regression to measure the impact of Covid 19 on USA stock return. They found that pessimism has a persistent impact on stock returns. Smales (2021) has proved that the IT and healthcare industries benefited out of Covid-19 using Google Search Volume (GSV) Index to prove.

Wang et al (2020) and Shahzad, et al. (2021) employed high frequency data to predict the stock price, whereas, Shahzad, et al. (2021) studied the volatility spillover using high frequency data of Chinese companies. Wang et al (2020) used high frequency data to test the forecasting ability of VIX and EPU models. However, the reason for lack of research with high frequency data may be unavailability or inaccessibility of data to the researchers.

**Table 7: Percentage analysis of variables studied in articles.**

Variable Studied	Number of Articles	Percentage
Return	62	60.19
Volatility	25	24.27
Sentiment Text Analysis	3	2.91
Spillover Effect	2	1.94
Investment Behavior	4	3.88
Others	7	6.80

Source: Authors' Compilation

Table 7 shows the variables studied in the selected research papers. Out of 103 research publications, 62 researchers analyzed stock returns, accounting for 60.19 percent. Volatility was studied by 25 researchers. However, only two researchers studied the spillover effect of the stock market. Sentiment and investor's behavior plays a significant role in the stock market specifically in the scenarios like Covid-19. In total only seven studies focused on investors behavioral analysis. The lack of research in this field offers the scope for further studies on behavior of stock market participants during the pandemic and bear market environment.

Similarly, researchers have not found research papers which addressed the relationship between yellow metal and stock market performance during the Covid-19. However, Sharif et al (2020), Sakurai and Kurosaki (2020) and Zhang and Hamori (2021) have studied the relationship between oil price and stock market performance. Even though, the linkage between commodity price and stock market performance in the emerging markets during the covid-19 is under the gray zone. Volume is a most crucial factor to identify the shift in market trend. However, only Chiah and Zhong (2020) have explored the impact of Covid -19 on trading volume. This poses the opportunity to explore the impact of Covid-19 on stock trading volume.

## 7. Citation Analysis

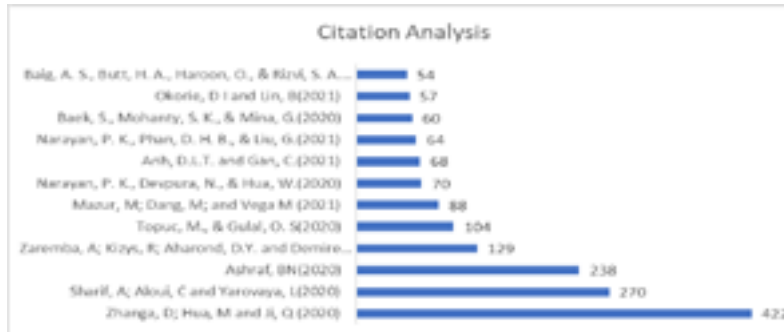
Fig 2 exhibits the citations of articles have considered for the analysis. Zhanga et al. (2020), Sharif et al. (2020) and Ashraf (2020) have scored 422, 270 and 238 citations respectively in a short span of time. Table 8 exhibits the frequency distribution of citation of articles and exhibits only five articles have more than 100 citations and most of the papers have less than 20 citations. Selected research papers are having less citations, as the period

of literature review are very close to their publication date. Out of 103 research papers selected for the study, 32 articles have published in the year 2020 and the rest of the papers have published in the year 2021.

**Table 8: Frequency Distribution of Citation**

Range	Frequency
0-20	85
21 - 40	4
41 - 60	5
61 - 80	3
81 - 100	1
101 - 120	1
121 - 140	1
141 - 422	3

Source: Authors' Compilation



**Figure 2: Citation Analysis**

Source: Authors' Compilation

## 8. Conclusion

COVID-19 has turned the world upside down in a brief period. Governments of various countries have introduced lockdown measures and travel restrictions to control the further spread of COVID-19, which was entirely new for this generation. Such restrictions hammered the economic activi-

ties and pushed down the stock market to have the low level of few years. In this context, the research on stock market reaction to Covid-19 has been lauded, as it aids in the formulation of investment ideas for investors and strategic policymaking for regulators. To address this issue, voluminous research articles and notes have recently been published. However, as the numbers increased so did the results. This resulted in clumps of conclusion and led to confusion. As a result, to have a bird's eye view of the impact of covid-19 on the stock market, this paper aims to organize the research papers in a systematic manner.

This review of literature highlighted the methodology used to address the Covid-19 impact on stock market and the scope for further studies in current body of knowledge.

During the influence of COVID - 19, capital market has experienced the complete swings from top to bottom and back to top. During this type of uncertain environment, in general, investment in gold is considered as a haven. However, like stock market, yellow metal also experienced a full swing during the presence of Covid-19. Hence, the study on the relationship between gold and stock market may provide the scope for portfolio diversification policies during the period like this.

On the other hand, Sharif et al (2020), Sakurai and Kurosaki (2020) and Zhang and Hamori (2021) have attempted to explore the relationship between oil price and stock market performance during the Covid-19. They registered the evidence for the correlation between oil price and USA stock market has increased during the Covid 19. Zhang and Hamori (2021) have documented that Covid-19 impact is more intensive than the financial crisis 2008.

However, earlier studies have not explored the relationship between oil price and other emerging stock market performance during the covid-19. In the globalization environment, increasing global linkage has reduces geographical diversification benefits. Hence, further study on the relationship between stock market performance and other asset classes may offer new sources of diversification to manage the crises like Covid.

#### *Lack of Survey*

It is important to have the knowledge about the investors' behavior and their attitude towards equity investment during a scenario like Covid-19. However, earlier studies have concentrated on market related information like return, volatility and volume and have completely ignored the survey on investors' attitude and behavior towards equity market. This leaves the investor's opinion and their behavior under the shadow. The study on investor's behavior, in an uncertainty period like Covid -19, may offer valu-

able information for the portfolio managers and policy makers.

#### *Missing Events*

Studying the price pattern around a particular event is called an event study. Maneenop and Kotcharin (2020) Heyden and Heyden (2020), Pandai and Kumari (202) and Naidu and Ranjeeni (2021) have studied how stock market reacted to the Covid - 19 events like first Covid-19 case reported in the country, lockdown news, first Covid-19 death report etc. In all these events, negative news had a negative impact on the stock return. However, no studies have attempted to capture the positive news like withdrawal of lockdown, vaccine developments, opening of borders etc. This gives the opportunity to explore the impact of positive news on Covid-19 and stock market reactions.

#### Technical analysis

In the software era, there are several models to predict stock prices ranging from the age-old chart analysis to popular RSI, MACD to new age artificial intelligence, machine learning and Algo trading tools. However, there were no studies attempting to explore the predictability of those models during the Covid 19. This may help to formulate the policy for the stock trading community during the period of uncertainty.

#### **Conflict of Interest**

We, authors of this paper, explicitly state that there is no conflict of interest in this review paper.

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