



IMPACTS OF COVID-19 ON THE STOCK MARKET

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ABSTRACT

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This study investigates COVID-19's impact on the Indian stock market's daily average return and trading volume. The investigation aims to determine the general market's and nine key sectors' pandemic vulnerability and the pandemic's impact on market volatility. All industries were affected by the epidemic, according to the research. The benchmark index maintained average returns. Reduced volatility reduced market returns and boosted liquidity.

KEYWORDS: *average returns, COVID-19, Indian stock market, trading volume.*

INTRODUCTION

COVID-19 is a game-changing factor for all countries, be it the world's superpower, the United States of America or the next in line for the title, China. COVID-19 was declared a pandemic by the World Health Organization (WHO) on March 11, 2020.

Since the inception of the COVID-19 pandemic, all economies have been fully or partially shut down, and citizens have been forced into lockdown for months, deteriorating national income, employment rate and overall industrial production of developing and developed countries. Even the most secure country in health and sanitisation, Italy, has not been left out of the declining economic trends due to the ongoing pandemic (Reuters, 2020). Amidst all the economic, social, and political chaos, global financial markets have not been unaffected (He et al., 2000; Liu et al., 2020b). The stock markets witnessed an immediate price fall and skyrocketing volatility when the pandemic hit the countries (Baker et al., 2020). While COVID-19 hit the developed economies most initially, emerging economies such as

India, Brazil, Peru, and Mexico were hit severely in the second wave of the pandemic. The developing countries witnessed a severe impact on their economic activities due to partial lockdowns and, thus, on the financial markets. In many countries, some sectors performed better than other hard-hit sectors, such as Pharmaceuticals and Postal Services.

Pre COVID

India emerged as one of the best-performing equity markets in 2018, with a negative dollar return of 5.6% in a year when global stock markets were rattled by trade tensions and a slowing earnings recovery. The Brazilian Bovespa performed slightly better than India, returning a negative 1.8%

All major equity indices in developed and emerging markets ended the year in the red, with the Chinese Shanghai Composite losing up to 28.7% in dollar terms, the most in Asia, followed by South Korea, which lost 20.5%.

However, the Nifty's 3.2% gain in rupee terms was primarily driven by domestic institutional buying throughout the year. Domestic institutional investors-insurance companies, banks, and mutual funds have purchased a record Rs 1.1 lakh crore (about \$17 billion) of shares this year, cancelling out foreign sales of \$4.4 billion.

The benchmark Nifty trades at a price-earnings(PE) multiple of 16.7 times estimated one-year forward earnings, compared to the long-term average PE of 16.2 times. This compares to 5.8 times for the Kospi and 14.5 times for the Jakarta Composite. Russian equities were the least. Expensive in the emerging market, with a forward price-to-earnings ratio of 5.3, followed by South Korean equities at 8.6, according to Bloomberg Data Back home. Vodafone Idea and Tata Motors fell 60% each in the BSE 100 index. In contrast, Bharti Airtel, Yes Bank, Aditya Birla Capital, and Bharat Electronics fell between 41% and 52% when it came to the top performers. Bajaj Finance comes out on top with a 50.3% gain. Software exporters such as Tech Mahindra and TCS gained 43.1% and 40.2%, respectively, as investors bet on the rupee depreciating against the US dollar. The local currency fell 8.5% against the US dollar last year. BSE's 19 sectorial indices lost money in 2018, except BSE IT. BSE Tech, BSE FMCG, Bankex, BSE Finance, and BSE Energy, which fell by as much as 41%. This was followed by a 31% drop in BSE Realty and a 22% drop in BSE Auto.



A look at the monthly return of this index shows that 2018 had the second-highest number of months with negative returns after a seven-year gap in 2011 when nine months suffered the same fate.

Every year, the volatility and growth levels in Indian equity markets vary depending on the global and domestic scenario and investor participation. The year

2018 is also coming to an end at its own pace. The Nifty 50, a 50-stock index, saw seven months end in the red in 2018, compared to just four and five months in the previous two calendar years.

A look at the monthly return of this index shows that 2018 had the second-highest number of months with negative returns after a seven-year gap in 2011, when nine months ²/₃ suffered the same fate. 2011 was the only year in more than two decades to have the most significant number of months with a loss.

Exploring the year's monthly events could help to explain the performance. The S&P BSE Sensex finished 2017 at an all-time high closing level of 34,057, and the Indian equity benchmark recorded a full-year total return of 29.56 per cent. Small-cap stocks outperformed mid-cap and large-cap stocks.

The S & P BSE Sensex had a difficult month on equity investments testing the Indian e US-led global equity market sell-off and dragging the index even further.

March was a difficult month for global equity. Expected rate cuts by the Reserve Bank of India acted as a tailwind.

In June, equities faced a challenging environment as trade tensions weighed on global equity markets, contributing to a rise in risk-off sentiment. On the other hand, Equities gained steadily in July as the country's solid economic outlook provided tailwinds for growth. The S&P BSE Sensex closed the month at a record high of 37,607. The benchmark index overcame an early-month sell-off in emerging markets to set eight new all-time highs in August. After ending August at an all-time high, it began to fall sharply in September. The benchmark fell to its lowest monthly performance since February 2016 as concerns about exports in a deteriorating global trade environment weighed on the index.

The markets fell for the second consecutive month in October, owing to foreign fund outflows and a worsening global outlook. Rumours exacerbated currency pressures that RBI Governor Urjit Patel would resign. Equities rose across the board in November, possibly due to trade tensions between the United States and China. December was marred by weak global cues and cautious sentiment ahead of next year's general elections.

During COVID

They are categorised into four sections. Section I discusses the literature review of the impact of COVID-19 on the financial market. Section II enlists data and methodology used in the analysis. In section III, we describe the trends of the data set studied and portray the results and their research. In section IV, we conclude the findings of the paper.

1. LITERATURE REVIEW

Since COVID-19 has spread so quickly, several studies have been done on its influence on established and emerging economies. Baker et al. (2020) say the epidemic caused a global economic crisis. It caused stock market slumps and volatility. Daube (2020) and Dev and Sengupta (2020) explain that the financial markets were already toxic when COVID-19 was introduced, causing stock market disasters across nations. A crisis-like event might cause unanticipated stock market fluctuations, challenging established variable correlations. This motivates us to research the pandemic's influence on market return and volume. Some researchers have examined COVID-19, stock markets (Phan & Narayan, 2020), and industrial response to the pandemic (Xiong et al., 2020). COVID-19 also affects stock market volatility (Chen et al., 2020). He et al. (2020c) studied COVID-19's effect on stock returns in China, Italy, South Korea, France, Spain, Germany, Japan, and the USA. Their data suggest that COVID-19 caused negative returns on financial markets and bidirectional spillover effects across nations. All assessed stock markets declined when the pandemic hit (Ali et al., 2020; Liu et al., 2020b). Negative investor sentiment produced by the virus led to deteriorating stock returns in Asian countries (Liu et al., 2020b; Topcu & Gulal, 2020). (Liu et al., 2020b). Ozil and Arun (2020) tested COVID-19's effects on the US, UK, Japan, and South Africa. Lockdown days, monetary policy decisions, and international travel restrictions affected stock prices in all nations surveyed. Gormsen and Kojien (2020) studied COVID-19's impact on economic development and stock prices and concluded that it reduces stock dividends. Government stimulus increased dividend performance. The stock market responded fast to the COVID-19 epidemic, and returns decreased with the announcement and the increasing number of infections (Ashraf, 2020; Mishra et al., 2020; Yilmazkudey, 2020). Barro et al. (2020) observed that flu-related mortality in 48 nations reduced stock market returns. Some publications demonstrate a positive association between COVID-19 and stock returns (Liu et al., 2020c; Prabheesh et al., 2020). Topcu and Gulal (2020) say the pandemic hurt stock markets until April 10. COVID-19's influence decreases with time. Alber (2020) explored how the stock markets of the six worst-affected nations reacted to the COVID-19 pandemic. The results showed that stock market return was more sensitive to coronavirus cases than deaths, and accumulated points had a more significant impact than fresh instances. Ortmann et al. (2020) studied retail investor reaction to COVID-19. When COVID-19 cases doubled, investor trading intensity jumped 13.9%. As the pandemic spread, investor deposits and new accounts rose. The Dow Jones Industrial Average and FTSE

indices fell, causing investors to reduce leverage to avoid risk.

In March 2020, NSE and BSE each lost 23% of listed businesses' market capitalisation. Overall, stock prices fell continuously in March 2020. Singh and Neog (2020) found that the decrease in Sensex and NIFTY is more rapid after the first week of March 2020. The Financial, Real Estate, and Banking sectors lost an estimated 2.81 lakh crore. Alam et al. (2020) studied COVID-19's impact on India's stock market. Their findings suggest that the public panicked and aberrant returns reduced during the epidemic pre-lockdown. The public acquired the trust during the shutdown, which boosted anomalous returns.

In times of disease-related news, Donatelli et al. (2016) discovered (DRNs). Positive investor mood boosts pharmaceutical stock performance. Fu and Shen (2020) found a detrimental influence on energy businesses' performance during COVID-19. Mazur et al. (2021) analysed numerous industries and concluded that natural gas, food, healthcare, and software have higher returns than petroleum, real estate, entertainment, and hospitality. He et al. (2020b) analysed the pandemic's impact on the industry in China and found that four of eight industries were robust while the other four were negatively affected.

Studies show COVID-19 hurts energy company performance (Fun & Shen, 2020, Polemis & Soursou, 2020). Similar research indicated a detrimental impact of COVID-19 on the oil market (Qin et al., 2020). Contradictory results on the crude oil market and the US stock market imply that COVID-19 had a favourable impact on the returns of both markets (like, 2020a; Liu et al., 2020c; Narayan, 2020c). During COVID-19, oil price volatility soared (Devpura & Narayan, 2020, Salisu & Adediran, 2020). Huang and Zheng (2020) observed that crude oil futures price elasticity declined post-COVID-19. During a pandemic, the stock market and oil prices move together, according to Prabheesh et al. (2020). Narayan (2020b) observed that COVID-19 affected exchange rate shock resistance. Some analyses considered the exchange rate market inefficient during COVID-19 (Narayan, 2020a). Devour (2020) observed that oil prices don't predict the yen during COVID-19.

Salisu and Sikiru (2020) found that Asia-Pacific Islamic stocks were a good hedge against COVID-19 uncertainty. Like (2020b) observed that three out of five Asian economies remained resilient, while China and Korea had a beneficial impact. Gil-Alana and Claudia-Quiroga (2020) examined Asian stock markets and COVID-19. Korean and Chinese stock market shocks are lasting, whereas Korean market shocks are transient. Sharma (2020) found that during COVID-19, Asian area volatility was related to five Asian developed countries.

Yan and Qian (2020) found that consumer industry stock values dropped in the epidemic's early

days and recovered in response to government actions. The COVID-19 outbreak increased the financial industry's systematic risk. The systematic risk rose above Banking and Insurance risks (Lan et al., 2020). In their paper, He et al. (2020a) measured the impact of the COVID-19 pandemic on stock market sectors. They researched Chinese stock prices. Their data show inconsistent stock price behaviour on the two exchanges. Zaremba et al. (2020) studied how government policy responses to new coronaviruses affected stock market volatility in 67 nations. They did panel regression on five volatility metrics and indicated that COVID-19 actions increase stock market volatility. Phan and Narayan (2020) studied the response of 25 stock markets to COVID-19 events like the WHO proclamation, lockdown, stimulus package, and travel restrictions. In a descriptive analysis, they observed that stock markets overreact owing to uncertainty. More information leads to market corrections.

Salisu and Akanni (2020) used the Global Fear Index for the COVID-19 pandemic to predict stock market returns. The fear index indicates that pandemic stock returns well. Chen et al. (2020) created a proxy for coronavirus fear sentiment using Google search patterns to measure COVID-19's influence on VIX and Bitcoin returns and volume. Vector autoregressive model results show that fear feeling boosts VIX and Bitcoin trading volume. Coronavirus hurts Bitcoin returns. Haroon and Rizvi (2020) found that growing coronavirus incidence reduces market liquidity in 23 emerging economies. As COVID-19-related mortality flattens, equity markets see greater liquidity. Government policy intervention to contain the epidemic also improves market liquidity by reducing investor anxiety. Han and Qian (2020) studied COVID-19's impact on Chinese enterprises' innovation across sectors. During the pandemic, all Chinese enterprises displayed increasing creativity. After the COVID-19 outbreak, Chinese banks boosted private sector credit, according to Appiah-Otoo (2020).

Liu et al. (2020a) used wavelet-based approaches to assess China's COVID-19 pandemic resistance. The study found that China's decoupled economy is better able to handle the pandemic than other economies. Liu et al. (2020d) examined the influence of the pandemic on household consumption using OLS regression on survey data. The data show that the pandemic reduced household consumption, especially in rural areas. The study found that mobile payments enhance urban household purchasing even during the pandemic. Shen et al. (2020) found that COVID-19 affects company performance. Using listed Chinese company financial data, they found that the negative effect is more significant in pandemic-affected areas. The pandemic also affected tourism, catering, and transportation. Xiong et al. (2020) found that COVID-19 affected transportation, food and beverage retail, hotel and tourist

enterprises, postal warehousing, real estate, video entertainment, and construction. Firm-specific factors and financial state determine a firm's COVID-19 reaction.

Narayan et al. (2020) used a GARCH model to examine the impact of the exchange rate on Japanese stock market performance during the COVID-19 pandemic. They discovered that one standard deviation of Yen depreciation leads to 71% higher stock returns. Pre-COVID-19 stock market returns increased by 24-49%. Thus, the currency rate influences market return more during COVID-19. Gu et al. (2020) used Difference-in-Difference to examine the impact of COVID-19 on different industries. The pandemic slashed industrial firms' economic activity by 57%. Construction, information transfer, computer services and software, health care and social work organisations responded well.

Prabheesh (2020) studied FPI and stock market returns in India during COVID-19. The Granger causality test indicated that FPI predicts Indian stock returns. When FPIs left the market during the pandemic, stock returns fell. Aravind and Manojkrishnan (2020) studied COVID-19's impact on India's pharmaceutical industry. Only two of the ten Pharma companies they evaluated trended against the benchmark index. Overall, the Indian Pharma sector did not follow the projected contrarian effect.

2. DATA AND METHODOLOGY

The research's daily data shows the Indian stock market's sector-by-sector performance over a year. The timeframe covers market activity before and during the COVID-19 epidemic (08/07/2019 to 10/03/2020). The timeline is divided on 11/03/2020 when WHO proclaimed COVID-19 a widespread outbreak. NIFTY sectorial indices represent sectorial activity, whereas NIFTY 50 measures broad market activity. Automobile, pharmaceuticals, IT, FMCG, energy, financial services, real estate, banking, and metal are studied. The Volatility Index (VIX) measures Indian stock market volatility. Average return measures overall and sectorial stock market performance, whereas trading volume measures market liquidity (Lei, 2005). Change in VIX symbolises volatility, and a dummy variable was inserted to account for COVID-19, Le, March 11, 2020, forward. In addition to return, volume, volatility, and COVID-19 dummy, daily data allowed for the inclusion of essential control variables. These include oil prices, exchange rates, FPI, S&P 500, and government bond-yield movements. Data gaps were filled with the series' mean (Peng & Lei, 2005). The table lists all variables. The study uses the mean comparison test to examine COVID-19's impact on stock market activity. This test compares the variables' means before and during the COVID-19 epidemic. It shows whether COVID-19

mean return and volume are higher or lower than pre-COVID-19. For this test, the data is classified into two 79-observation time series for each variable: pre-

COVID-19 (19/11/2019 to 10/03/2020) and COVID-19 (11/03/2020 to 07/07/2020).

TABLE 1. Description of Variables

Variable Code	Variable Name	Definition	Source
NR	NIFTY Return	The daily return* of NIFTY 50 index	NSE
NV	Logged NIFTY Volume	The daily trading volume** of NIFTY 50 index	NSE
Cov	COVID-19 dummy	The value is 1 for all days post 11/03/2020 and 0 otherwise	-
VIX	Change in Volatility Index	Daily Percentage change in the Volatility Index	NSE
AR	Auto Return	The daily return of NIFTY Auto index	NSE
AV	Logged Auto Volume	The daily trading volume of NIFTY Auto index	NSE
PR	Pharmaceutical Return	The daily return of NIFTY Pharma index	NSE
PV	Logged Pharmaceutical Volume	The daily trading volume of NIFTY Pharma index	NSE
IR	IT Return	The daily return of NIFTY IT index	NSE
IV	Logged IT Volume	The daily trading volume of NIFTY IT index	NSE
FR	FMCG Return	The daily return of NIFTY FMCG index	NSE
FV	Logged FMCG Volume	The daily trading volume of NIFTY FMCG index	NSE
ER	Energy Return	The daily return of NIFTY Energy index	NSE
EV	Logged Energy Volume	The daily trading volume of NIFTY Energy index	NSE
MR	Metal Return	The daily return of NIFTY Metal index	NSE
MV	Logged Metal Volume	The daily trading volume of NIFTY Metal index	NSE

Variable Code	Variable Name	Definition	Source
FSR	Financial Services Return	The daily return of NIFTY Financial services index	NSE
FSV	Logged Financial Service Volume	The daily trading volume of NIFTY Financial services index	NSE
RR	Realty Return	The daily return of NIFTY Realty index	NSE
RV	Logged Realty Volume	The daily trading volume of NIFTY Realty index	NSE
BR	Banking Return	The daily return of NIFTY bank index	NSE
BV	Logged Banking Volume	The daily trading volume of NIFTY bank index	NSE
Oil	Change in Oil Price	Daily percentage change in Europe Brent Spot Price FOB (\$/barrel)	Eia.gov
EX	Growth in Exchange Rate	Daily percentage change in INR-USD Exchange Rate (INR/USD)	Yahoo Finance
FPI	Growth in Foreign Portfolio Investment	Daily percentage change in Net FPI investment in equity (Rs. Crore)	NSDL
SP	S&P Index Return	The daily return of S&P 500 index	Yahoo Finance
BY	Growth in Bond Yield	Daily percentage change in 1-year Indian Government Bond Yield	Investing.com

*Daily Return % = $[(P_t - P_{t-1}) / P_{t-1}] * 100$ where P_t is the current closing price, and P_{t-1} is the previous day's closing price. **Volume in INR

The paper uses Ordinary Least Squares (OLS) to investigate the association between Indian stock market performance and COVID-19. The analysis seeks to determine the impact of the Coronavirus epidemic on NIFTY 50, NIFTY sectorial, and VIX return and volume. Use time-series regression analysis instead of panel data analysis to account for sector-specific effects. This method creates a linear relationship between the dependent variable (index return or volume) and the independent variable (COVID-19 dummy), revealing

whether the pandemic affects the stock market. Industry-specific factors can be addressed by studying each sector separately. This paper employs OLS regression in line with Ortmann et al. (2020) to assess COVID-19's impact on the stock market over months.

This study's regressions follow a trend. First, COVID-19's impact on the broad market was studied by regressing the NIFTY 50 return on the COVID-19 dummy, recorded NIFTY 50 volume, VIX, and other control variables.

$ER_t = \alpha + \beta_1 EV_t + \beta_2 ER_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t + \gamma_1 Cov \cdot EV_t + \gamma_2 Cov \cdot VIX_t + \gamma_3 Cov \cdot Oil_t + \gamma_4 Cov \cdot ER_t + \gamma_5 Cov \cdot SP_t$	1.6	9
$EV_t = \alpha + \beta_1 ER_t + \beta_2 EV_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t$	2.6	9
$MR_t = \alpha + \beta_1 MV_t + \beta_2 MR_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t + \gamma_1 Cov \cdot MV_t + \gamma_2 Cov \cdot VIX_t + \gamma_3 Cov \cdot Oil_t + \gamma_4 Cov \cdot ER_t + \gamma_5 Cov \cdot SP_t$	1.7	10
$MV_t = \alpha + \beta_1 MR_t + \beta_2 MV_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t + \gamma_1 Cov \cdot Vix_t + \gamma_2 Cov \cdot Oil_t + \gamma_3 Cov \cdot SP_t$	2.7	10
$FSR_t = \alpha + \beta_1 FSV_t + \beta_2 FSR_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t$	1.8	11
$FSV_t = \alpha + \beta_1 FSR_t + \beta_2 FSV_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t$	2.8	11
$RR_t = \alpha + \beta_1 RV_t + \beta_2 RR_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t + \gamma_1 Cov \cdot RV_t + \gamma_2 Cov \cdot VIX_t$	1.9	12
$RV_t = \alpha + \beta_1 RR_t + \beta_2 RV_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t + \gamma_1 Cov \cdot RR_t$	2.9	12
$BR_t = \alpha + \beta_1 BV_t + \beta_2 BR_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t + \gamma_1 Cov \cdot BV_t + \gamma_2 Cov \cdot VIX_t$	1.10	13
$BV_t = \alpha + \beta_1 BR_t + \beta_2 BV_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t + \gamma_1 Cov \cdot BY_t$	2.10	13
$VIX_t = \alpha + \beta_1 NR_t + \beta_2 NV_t + \beta_3 NV_{t-1} + \beta_4 VIX_t + \beta_5 Cov_t + \beta_6 Oil_t + \beta_7 ER_t + \beta_8 FPI_t + \beta_9 SP_t + \beta_{10} BY_t + \gamma_1 Cov \cdot NV_t + \gamma_2 Cov \cdot SP_t$	3.1	14

$ER_t = \alpha + \beta_1 EV_t + \beta_2 ER_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t + \gamma_1 Cov \cdot EV_t + \gamma_2 Cov \cdot VIX_t + \gamma_3 Cov \cdot Oil_t + \gamma_4 Cov \cdot ER_t + \gamma_5 Cov \cdot SP_t$	1.6	9
$EV_t = \alpha + \beta_1 ER_t + \beta_2 EV_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t$	2.6	9
$MR_t = \alpha + \beta_1 MV_t + \beta_2 MR_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t + \gamma_1 Cov \cdot MV_t + \gamma_2 Cov \cdot VIX_t + \gamma_3 Cov \cdot Oil_t + \gamma_4 Cov \cdot ER_t + \gamma_5 Cov \cdot SP_t$	1.7	10
$MV_t = \alpha + \beta_1 MR_t + \beta_2 MV_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t + \gamma_1 Cov \cdot Vix_t + \gamma_2 Cov \cdot Oil_t + \gamma_3 Cov \cdot SP_t$	2.7	10
$FSR_t = \alpha + \beta_1 FSV_t + \beta_2 FSR_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t$	1.8	11
$FSV_t = \alpha + \beta_1 FSR_t + \beta_2 FSV_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t$	2.8	11
$RR_t = \alpha + \beta_1 RV_t + \beta_2 RR_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t + \gamma_1 Cov \cdot RV_t + \gamma_2 Cov \cdot VIX_t$	1.9	12
$RV_t = \alpha + \beta_1 RR_t + \beta_2 RV_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t + \gamma_1 Cov \cdot RR_t$	2.9	12
$BR_t = \alpha + \beta_1 BV_t + \beta_2 BR_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t + \gamma_1 Cov \cdot BV_t + \gamma_2 Cov \cdot VIX_t$	1.10	13
$BV_t = \alpha + \beta_1 BR_t + \beta_2 BV_{t-1} + \beta_3 Cov_t + \beta_4 VIX_t + \beta_5 Oil_t + \beta_6 EX_t + \beta_7 FPI_t + \beta_8 SP_t + \beta_9 BY_t + \gamma_1 Cov \cdot BY_t$	2.10	13
$VIX_t = \alpha + \beta_1 NR_t + \beta_2 NV_t + \beta_3 NV_{t-1} + \beta_4 VIX_t + \beta_5 Cov_t + \beta_6 Oil_t + \beta_7 ER_t + \beta_8 FPI_t + \beta_9 SP_t + \beta_{10} BY_t + \gamma_1 Cov \cdot NV_t + \gamma_2 Cov \cdot SP_t$	3.1	14

3. EMPIRICAL RESULTS AND ANALYSIS

After the news of COVID-19 being a pandemic hit the market, equities' overall trading volume jumped in eight sectors. The direction of the change in trading volume in one industry, real estate, after the pandemic is unknown. NIFTY-50 trade volume surged after the pandemic announcement. The returns in all nine sectors

changed significantly following the COVID-19 pandemic, although the direction of change is unknown. Similar findings are apparent in the NIFTY-50 index, where the difference in returns before and during COVID-19 is significant. In eight industries, including Metal, Financial Services, Bank, Energy, FMCG, IT, Pharmaceuticals, and Auto, returns during COVID-19

are higher than before the epidemic. In contrast, real estate returns decreased following COVID-19. COVID-19 NIFTY-50 returns were higher than pre-COVID-19 results.

We analyse the general market and sector-wise impact of the COVID-19 epidemic and VIX fluctuation on interest variables.

To begin the analysis, we tested the stationarity of all time series and discovered that they are stationary at a level (Appendix 1, Table 3). Table 4 shows that Equation 1.1's COVID-19 coefficient is negative and significantly affects NIFTY 50 return at the 10% level. COVID-19 influences market return with other variables. The interaction between VIX and COVID-19 is significant, showing a higher impact of VIX fluctuation in the presence of COVID-19. S&P return alone is not substantial, but it increases NIF. COVID-19 rejoins TY 50. COVID-19 has a more significant impact on market return with changes in VIX and S&P.

For Equation 2.1 (Table 4), the constant term and NIFTY 50 return regression coefficients were significant, as was the volume lag, which had a positive and substantial impact on volume. COVID-19 positively and significantly influences NIFTY 50 volume, showing more market liquidity during the epidemic. Among the control variables, oil price change decreases market volume but enhances market liquidity when it interacts with COVID-19.

Table 5 shows COVID-19's influence on returns and volume in the auto sector. Both constant term and Auto volume affect Auto return positively. Auto return boosts Auto volume. While return latency hurts recovery, volume lag boosts volume. COVID-19 hurts Auto returns, but not VIX or S&P returns. An increase in VIX change reduces Auto return, and the interaction enhances this effect. Oil price changes influence Auto return positively, and the S&P return coefficient interacts with COVID-19. Increases in VIX and COVID-19 increase auto volume. Thus, auto industry performance dipped during COVID-19 despite increased liquidity.

COVID-19 hurts the NIFTY Pharma index return (Table 6). COVID-19 boosts pharma volume. Changes in VIX also negatively affect Pharma returns. With COVID-19, the book has a beneficial impact on recovery. Oil prices and COVID-19 combine to affect Pharma's performance negatively. Pharma volume is positively affected by its lag, and COVID-19 enhances the sector's liquidity in solo, with sector return, and when VIX appreciates.

The return for the NIFTY IT index (Table 7) is much lower during the COVID-19 epidemic than without. The VIX coefficient is negative, signifying a drop in return when volatility rises. In the presence of COVID-19, a VIX increase reduces the return. COVID-19 and IT volume positively affect return, but exchange

rate negatively. IT volume and lag are correlated. COVID-19 is noteworthy and encouraging, demonstrating improved IT sector liquidity during the Coronavirus epidemic.

COVID-19 has a strong negative influence on FMCG return (Table 8) but a positive impact on volume. Both the constant term and the variable lags are significant. The VIX change coefficient affects FMCG return negatively. In the presence of COVID-19, VIX worsens return. Changes in VIX and FMCG return affect FMCG volume positively and significantly.

Table 9 shows the COVID-19 impact on NIFTY Energy's return for the energy industry. Despite being negative, COVID-19 no longer affects Energy return. Lag and VIX affect energy return badly. With COVID-19, a rise in VIX reduces the return. In the presence of COVID-19, oil price changes have a negative interaction term. COVID-19 positively affects energy industry liquidity. Energy return and VIX fluctuation increase Energy volume. The constant time and volume lag both positively affect Energy volume.

COVID-19 affects NIFTY Metal's return and volume (Table 10). The interaction terms are significant, demonstrating that regressors affect metal sector returns more during COVID-19. VIX change negatively affects Metal return but positively affects Metal volume. Oil price change affects Metal return positively but negatively impacts volume. In the presence of COVID-19, oil price fluctuation negatively affects Metal Return and Volume positively. The interaction between COVID-19 and exchange rate change is considerable, demonstrating a negative return. COVID-19 interacts with S&P to boost Metal return.

Table 11 shows that COVID-19 strongly affects the Financial Services sector return and volume. Financial Services index returns are lower during COVID-19. COVID-19 benefits the book. The constant term coefficient is relevant in both circumstances, but the lag is only in volume. Financial Services volume boosts return. Significant Change in the VIX coefficient implies that an increase in VIX causes sector return to fall. This sector's volume is positively affected by sector return but not by VIX. The Real Estate sector's recovery (Table 12) is unaffected by volume or latency. Changes in VIX affect returns but not liquidity in the Realty sector. COVID-19 strongly negatively affects Realty return when interacting with VIX fluctuation and volume. COVID-19 has no impact on Realty volume. Control factors don't alter sector volume.

Table 13 shows that COVID-19 has a negative influence on banking returns. Though the sector volume impact isn't significant, its interaction with COVID-19 is. VIX change negatively affects sector return but not volume, and in the presence of COVID-19, it further reduces the return. Bank volume doesn't affect VIX. Constant term affects Bank volume but not return.

COVID-19 increases bank volume as bond yields rise. Aside from the interaction term, Bank returns and lag positively affect the Banking sector's trade volume. No other regressor affects bank liquidity.

Table 14's Change in Volatility Index is negatively impacted by NIFTY return and COVID-19. VIX change plummets with COVID-19. Positive NIFTY volume and COVID-19 interaction. S&P return negatively affects VIX change, whereas COVID-19 negates this effect by making the coefficient positive.

Figures 1 and 2 show the total study with forest plots. Horizontal lines show each dependent variable's

coefficients and 95% confidence intervals. Horizontal lines to the left of 0 indicate negative COVID-19 influence, while those to the right indicate positive. The COVID-19 epidemic has affected the liquidity of NIFTY 50 index stocks and most industries, including Auto, Pharmaceuticals, IT, FMCG, Energy, Metal, and Financial Services. Only Banking and Real Estate were unaffected. All industries saw positive trading volume changes due to COVID-19's implications on liquidity. Despite positive liquidity throughout the epidemic, Realty and Banking were unaffected by COVID-19.

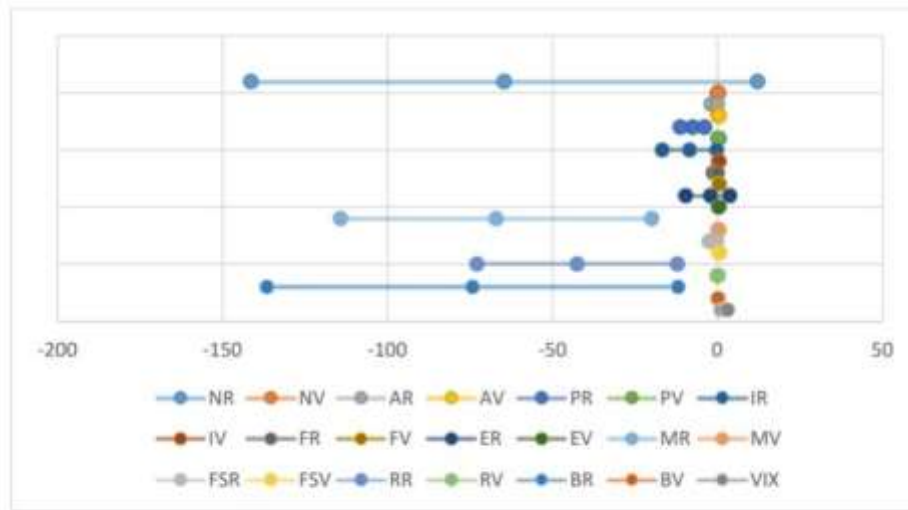


FIGURE 1. Forest Plot summarizing the impact of COVID-19 on sector return and volume

The financial performance of NIFTY 50 in terms of average returns witnessed no significant change during COVID-19 at a 5% significance level. At 10% significance, COVID-19's influence is noteworthy. Banking, Real Estate, Financial Services, Metal, FMCG, IT, Pharmaceuticals, and Auto saw negative returns due to COVID-19. Contrary to Fun and Shen (2020) and Polemis and Source (2001), the COVID-19 coefficient for Energy sector returns was negative and insignificant (2020). Only the Energy sector kept pace with NIFTY 50 because the epidemic didn't affect its returns.

The insignificant impact of COVID-19 on NIFTY 50 return implies that while most other markets have already suffered a significant decrease in performance, the total stock market return has shown resistance to the projected pandemic problem. Most sectoral indices reveal an adverse effect of COVID-19 on return, according to He et al. (20206) for the Shanghai stock exchange, and a positive influence on volume, contradicting the findings of Haroon and Rizvi (2020). They demonstrated a negative impact on market liquidity. Auto, Pharma, IT, FMCG, Metal, and Financial Services have decreased returns and increased volume. COVID-19 highlighted unfavourable investor

sentiment, hurting these sectors' returns. This could result from lower sales revenue in these industries, especially Automobiles and Metal, whose demand can be delayed in uncertain times. Manufacturing closure adds to worries. Pharma's inability to solve COVID-19 could send a wrong signal to investors. It looks to be firms' best bet for continuing operations throughout the pandemic, but initial COVID-19 returns don't reflect this. Essential items cannot be delayed, which is good news for the FMCG sector. Still, consumers can select lower-priced substitutes and forego buying extra stuff, which affects sales revenue. This sector may see lower returns. Financial Services and Banking likewise see negative returns as consumers migrate to essentials due to decreasing incomes. Demand for dwellings and land has slowed, lowering real estate returns. Energy is the only area where COVID-19 hasn't hurt returns. Reduced energy demand due to economic shutdowns has led to a massive drop in oil prices, which investors may perceive as a chance to buy Energy stocks. Collective buying and bullish mood boost price and return.

COVID-19 has increased market activity due to rising investor interest in equities. The Securities and Exchange Board of India (SEBI) has eased restrictions

on rights issues, follow-on public offerings, simplified pricing systems, etc., to help corporations raise funds and attract new investors (The Asian Age, 2020). SEBI chairman says retail investor activity rose during the COVID-19 closure, and numerous new Demat accounts were formed (The Asian Age, 2020). The RBI's 115-basis-point Repo rate drop has also moved investor

preference from fixed-income to equity (NDTV Profit, 2020). Le only sees two sectors affected by COVID-19. Banking and property. Despite market liquidity, no industry is pandemic-proof. Contrary to expectations, COVID-19 hurts VIX change.

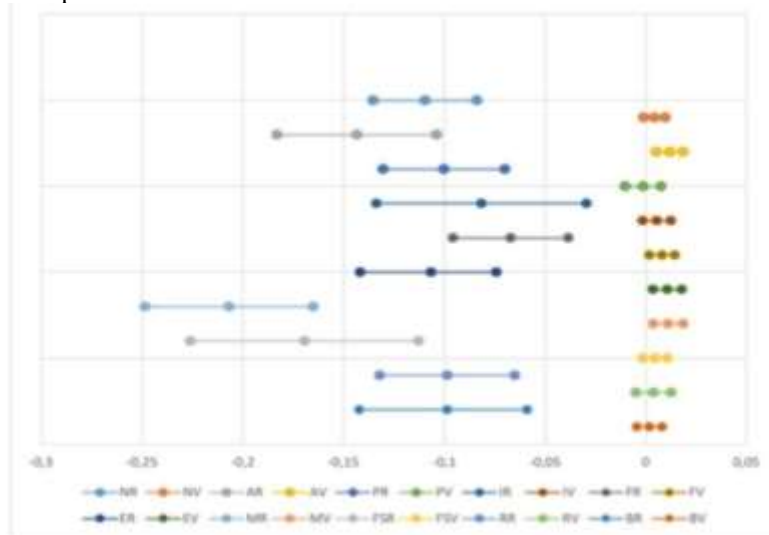


FIGURE 2. Forest Plot summarizing the impact of VIX on sector return and volume

The NIFTY 50 index remained impervious to the COVID-19 epidemic, although sectoral returns were affected. The NIFTY 50 index is constructed of the top-performing enterprises across all industries. This index's industrial diversification can lessen pandemic effects. Sectoral indices include sector-specific enterprises that may have a more robust (positive or negative) pandemic reaction. Top stock market performers can perform well in a pandemic, while medium or slow-growth enterprises in sectoral indices cannot. Sectoral indices show pandemic impact, while the benchmark index does not.

The COVID-19 epidemic can increase market uncertainty, causing investors to leave long holdings. Selling pressure lowers prices and market returns. NIFTY 50's average returns fell, but the decline was slight. Individual sectors suffered greatly from the outbreak. These sectors increased liquidity and gave investors hope of a rebound. During the epidemic, the general market index also gained liquidity. All sectors remained consistent with the benchmark index in liquidity and market momentum.

Appendix 1. Empirical Results

TABLE 3. Breakpoint ADF Unit Root Test Results

Variables	Test statistic	p-value at I(0)	Variables	Test statistic	p-value at I(0)
NR	-18.5524	<0.01*	MR	-18.6035	<0.01*
NV	-7.7319	<0.01*	MV	-10.8148	<0.01*
VIX	-13.5546	<0.01*	FSR	-17.1033	<0.01*
AR	-17.5438	<0.01*	FSV	-5.5375	<0.01*
AV	-8.8558	<0.01*	RR	-15.7274	<0.01*
PR	-16.6215	<0.01*	RV	-10.6375	<0.01*
PV	-7.3491	<0.01*	BR	-16.9967	<0.01*
IR	-20.5356	<0.01*	BV	-7.2000	<0.01*
IV	-7.0746	<0.01*	Oil	-21.9112	<0.01*
FR	-18.7481	<0.01*	EX	-21.5819	<0.01*
FV	-9.4985	<0.01*	FPI	-21.2489	<0.01*
ER	-20.1098	<0.01*	SP	-10.5749	<0.01*
EV	-8.5922	<0.01*	BY	-16.9822	<0.01*

TABLE 8. Regression results for Equation 1.5 and Equation 2.5

Dependent Variable: FMCG Sector Returns			Dependent Variable: FMCG Sector Volume		
Independent Variable	Coefficient	p- value	Independent Variable	Coefficient	p- value
FV	1.11653	0.0026**	SP	-0.00403	0.7002
SP	0.056529	0.5032	VIX	0.00798	0.0135**
VIX	-0.06718	0**	OIL	-0.00174	0.5721
OIL	0.005204	0.8142	FPI	-8.81E-06	0.5859
FPI	5.57E-05	0.1223	EX	0.038838	0.2485
EX	-0.30744	0.0959*	COV	0.404269	0**
COV	-0.76268	0.0216**	BY	0.006776	0.5412
BY	-0.04152	0.3625	FR	0.040474	0.0017**
FR(-1)	-0.27489	0.0542*	FV(-1)	0.493526	0**
COV*VIX	-0.12048	0.005**	C	1.676401	0**
COV*SP	0.152478	0.2225			
C	-3.68427	0.0023**			
Durbin Watson Stat	1.8077		Durbin Watson Stat	2.2036	
R-squared	0.392142		R-squared	0.697311	

* and ** indicate statistical significance at the 10% and 5 % levels respectively.

TABLE 9. Regression results for Equation 1.6 and Equation 2.6

Dependent Variable: Energy Sector Returns			Dependent Variable: Energy Sector Volume		
Independent Variable	Coefficient	p- value	Independent Variable	Coefficient	p- value
EV	0.096651	0.7612	VIX	0.010574	0.0039**
VIX	-0.10666	0**	SP	-0.03519	0.0025**
SP	0.092235	0.4266	OIL	0.00061	0.8539
OIL	0.111217	0.0169**	FPI	-4.74E-06	0.7866
FPI	-0.00015	0.0062**	EX	0.039527	0.2754
EX	-0.08446	0.6666	COV	0.270508	0**
COV	-9.71723	0.1637	BY	0.001841	0.877
BY	-0.07339	0.2664	ER	0.034016	0.0061**
ER(-1)	-0.20969	0.0136**	EV(-1)	0.506841	0**
COV*EV	1.931872	0.1668	C	2.240956	0**
COV*VIX	-0.0989	0.0495**			
COV*OIL	-0.10941	0.0328**			
COV*EX	-0.77611	0.0908*			
COV*SP	0.322434	0.034**			
C	-0.46778	0.7392			
Durbin Watson Stat	1.8783		Durbin Watson Stat	2.1025	
R-squared	0.482496		R-squared	0.578847	

* and ** indicate statistical significance at the 10% and 5 % levels respectively.

TABLE 6. Regression results for Equation 1.3 and Equation 2.3

Dependent Variable: Pharma Sector Returns			Dependent Variable: Pharma Sector Volume		
Independent Variable	Coefficient	p- value	Independent Variable	Coefficient	p- value
PV	0.409693	0.1854	SP	-0.0305	0.0083**
VIX	-0.10026	0**	VIX	-0.00147	0.7451
SP	-0.00318	0.9766	PR	0.026542	0.1823
OIL	0.065366	0.1525	OIL	0.000589	0.8532
FPI	-5.61E-06	0.9451	FPI	-2.23E-05	0.1739
EX	0.061108	0.7227	EX	2.01E-02	0.554
COV	-7.68333	0.0001**	COV	0.242935	0**
BY	-0.03754	0.5071	BY	-0.02194	0.0515*
PR(-1)	-0.02352	0.6889	PV(-1)	0.627147	0**
COV*OIL	-0.10765	0.026**	COV*PR	0.047603	0.0567*
COV*SP	0.422696	0.0009**	COV*VIX	0.012601	0.053*
COV*PV	1.92E+00	0.0002**	C	1.187532	0**
C	-1.22E+00	0.2187			
Durbin Watson Stat	1.8724		Durbin Watson Stat	2.2210	
R-squared	0.413223		R-squared	0.731519	

* and ** indicate statistical significance at the 10% and 5 % levels respectively.

TABLE 7. Regression results for Equation 1.4 and Equation 2.4

Dependent Variable: IT Sector Returns			Dependent Variable: IT Sector Volume		
Independent Variable	Coefficient	p- value	Independent Variable	Coefficient	p- value
IV	-0.04473	0.9084	VIX	0.00531	0.137
VIX	-0.08169	0.0023**	SP	-0.01583	0.1775
SP	0.294889	0.0026**	OIL	-0.0045	0.1862
OIL	0.02321	0.3121	FPI	-1.38E-06	0.9388
FPI	0.000131	0.1215	EX	0.059864	0.1117
EX	0.033186	0.8653	COV	0.296812	0**
COV	-8.55876	0.0417**	BY	0.015188	0.2145
BY	-0.01438	0.8176	IR	0.022847	0.0618*
IR(-1)	-0.30747	0.0013**	IV(-1)	0.363907	0**
COV*IV	2.372529	0.0482**	C	2.038507	0**
COV*VIX	-0.11918	0.0067**			
COV*EX	-1.11738	0.0199**			
C	0.202245	0.8674			
Durbin Watson Stat	1.8986		Durbin Watson Stat	2.1621	
R-squared	0.461646		R-squared	0.408386	

* and ** indicate statistical significance at the 10% and 5 % levels respectively.

TABLE 4. Regression results for Equation 1.1 and Equation 2.1

Dependent Variable: Nifty Return			Dependent Variable: Nifty Volume		
Independent Variable	Coefficient	p- value	Independent Variable	Coefficient	p- value
NV	0.299261	0.4438	VIX	0.004179	0.131
COV	-64.7255	0.0982*	SP	-0.00944	0.2537
VIX	-0.10967	0**	OIL	-0.01547	0.0168**
OIL	0.023136	0.3339	NR	0.038073	0.0502*
EX	-0.27904	0.0765*	FPI	-1.38E-05	0.2587
FPI	-1.57E-06	0.9681	EX	0.022269	0.3864
SP	0.087638	0.2652	COV	0.074022	0.0258**
BY	-0.0605	0.2786	BY	0.000395	0.9622
NR(-1)	-0.17628	0.0499**	NV(-1)	0.621152	0**
COV*NV	3.164472	0.0996*	COV*NR	-0.01609	0.4156
COV*VIX	-0.13341	0.0024**	COV*OIL	0.015204	0.023**
COV*EX	-0.65124	0.1666	C	7.653711	0**
COV*SP	0.336566	0.0048**			
C	-6.01278	0.4436			
Durbin Watson Stat	1.8902		Durbin Watson Stat	2.1927	
R-squared	0.529498		R-squared	0.530261	

* and ** indicate statistical significance at the 10% and 5 % levels respectively.

TABLE 5. Regression results for Equation 1.2 and Equation 2.2

Dependent Variable: Auto Sector Returns			Dependent Variable: Auto Sector Volume		
Independent Variable	Coefficient	p- value	Independent Variable	Coefficient	p- value
OIL	0.083609	0.0827*	OIL	0.000438	0.8871
AV	2.19E+00	0**	FPI	-3.20E-05	0.0487**
FPI	5.45E-05	0.4955	EX	-0.00283	0.9334
EX	-0.23618	0.3746	COV	0.253074	0**
COV	-1.07538	0.0161**	BY	-0.01372	0.2168
BY	-0.07046	0.279	SP	-0.01056	0.3084
SP	-0.11192	0.3426	VIX	0.011775	0.0006**
VIX	-0.1435	0**	AR	0.056935	0**
AR(-1)	-0.11997	0.0678*	AV(-1)	0.516988	0**
COV*VIX	-0.10407	0.0218**	C	2.20627	0**
COV*OIL	-0.06544	0.2561			
COV*EX	-0.83485	0.1704			
COV*SP	0.543091	0.0022**			
C	-9.95219	0**			
Durbin Watson Stat	1.7343		Durbin Watson Stat	2.1647	
R-squared	0.464813		R-squared	0.623841	

* and ** indicate statistical significance at the 10% and 5 % levels respectively.

TABLE 10. Regression results for Equation 1.7 and Equation 2.7

Dependent Variable: Metal Sector Returns			Dependent Variable: Metal Sector Volume		
Independent Variable	Coefficient	p-value	Independent Variable	Coefficient	p-value
MV	1.897678	0.0004**	VIX	0.011029	0.0036**
VIX	-0.20688	0**	SP	0.01347	0.5246
SP	-0.10727	0.4321	OIL	-0.01301	0.0795*
OIL	0.18766	0.0001**	FPI	-3.18E-05	0.1084
FPI	0.000157	0.0279**	EX	0.018032	0.5282
EX	-0.01804	0.9461	COV	0.196665	0**
COV	-07.2036	0.0054**	BY	-0.00084	0.483
BY	-0.09475	0.0858*	MR	0.04895	0**
MR(-1)	-0.12781	0.0443**	MV(-1)	0.312559	0**
COV*MV	3.531358	0.006**	COV*VIX	0.000603	0.2267
COV*VIX	-0.07301	0.1163	COV*OIL	0.012822	0.1080
COV*OIL	-0.17412	0.0012**	COV*SP	-0.03029	0.1473
COV*EX	-1.04474	0.0388**	C	12.78862	0**
COV*SP	0.569778	0.0029**			
C	-35.3301	0.0004**			
Durbin Watson Stat	2.0100		Durbin Watson Stat	1.9841	
R-squared	0.380834		R-squared	0.441935	

* and ** indicate statistical significance at the 10% and 5 % levels respectively.

TABLE 11. Regression results for Equation 1.8 and Equation 2.8

Dependent Variable: Financial Services Returns			Dependent Variable: Financial Services Volume		
Independent variable	Coefficient	p-value	Independent Variable	Coefficient	p-value
FSV	1.656154	0.0008**	VIX	0.004497	0.1462
OIL	0.028032	0.4582	SP	-0.01106	0.2635
SP	0.331042	0.0042**	OIL	-0.00066	0.7664
VIX	-0.16948	0**	FSR	0.027074	0.0012**
FPI	2.24E-05	0.6936	FPI	-2.28E-05	0.1321
EX	-0.70827	0.048**	EX	0.078037	0.0142**
COV	-1.50696	0.0107**	COV	0.399453	0**
BY	-0.05573	0.5808	BY	0.016048	0.1225
FSR(-1)	-0.10449	0.2233	FSV(-1)	0.466922	0**
C	-31.0003	0.0007**	C	10.01625	0**
Durbin Watson Stat	1.8880		Durbin Watson Stat	2.2170	
R-squared	0.336133		R-squared	0.688333	

* and ** indicate statistical significance at the 10% and 5 % levels respectively.

TABLE 12. Regression results for Equation 1.9 and Equation 2.9

Dependent Variable: Realty Sector Returns			Dependent Variable: Realty Sector Volume		
Independent Variable	Coefficient	p-value	Independent Variable	Coefficient	p-value
RV	0.25438	0.845	BY	0.013041	0.4554
VIX	-0.09862	0**	COV	0.019136	0.7168
SP	0.322376	0.0004**	EX	0.02893	0.5217
OIL	-0.01036	0.7113	FPI	-2.38E-03	0.2389
FPI	-0.00016	0.0812*	OIL	9.70E-04	0.8135
EX	-0.49257	0.0627**	RE	0.007826	0.6970
COV	-42.6135	0.0062**	SP	-0.01365	0.3309
BY	-0.03034	0.7289	VIX	0.003696	0.4052
RV(-1)	-0.04493	0.4729	RV(-1)	0.407279	0**
COV*RV	2.556053	0.0006**	COV*RE	0.03451	0.1338
COV*VIX	-0.13178	0.0009**	C	9.725192	0**
C	-3.50107	0.6526			
Durbin Watson Stat	1.7841		Durbin Watson Stat	2.2004	
R-squared	0.407804		R-squared	0.199023	

* and ** indicate statistical significance at the 10% and 5 % levels respectively.

TABLE 13. Regression results for Equation 1.10 and Equation 2.10

Dependent Variable: Banking Sector Returns			Dependent Variable: Banking Sector Volume		
Independent Variable	Coefficient	p-value	Independent Variable	Coefficient	p-value
BY	0.483273	0.224	VIX	0.001726	0.5857
VIX	-0.10063	0**	SP	-0.01205	0.3325
SP	0.498752	0.0009**	OIL	-0.00226	0.4634
OIL	0.028023	0.3128	FPI	-8.23E-06	0.5479
FPI	-2.96E-05	0.5392	EX	0.015804	0.6227
EX	-0.58793	0.0735*	COV	0.051535	0.1874
COV	-74.3318	0.0196**	BY	-0.01433	0.4057
BY	-0.07749	0.3951	BB	0.021756	0.0073**
BR(-1)	-0.09244	0.2635	BY(-1)	0.468359	0**
COV*BY	3.723041	0.0201**	COV*BY	0.042913	0.0481**
COV*VIX	-0.21082	0.0003**	C	6.53264	0**
C	-9.5862	0.2307			
Durbin Watson Stat	1.8804		Durbin Watson Stat	2.0332	
R-squared	0.417006		R-squared	0.509032	

* and ** indicate statistical significance at the 10% and 5 % levels respectively.

TABLE 14. Regression results for Equation 3.1

Dependent Variable: VIX Returns		
Independent Variable	Coefficient	p-value
SP	-0.80219	0.0703*
OIL	0.007163	0.8914
NV	-0.8802	0.608
NBL	-1.84187	0**
EX	-0.14722	0.83
COV	-310.897	0.0029**
BY	-0.14358	0.3942
FPI	0.000522	0.0747*
NV(-1)	2.823008	0.0907**
COV*NV	15.18069	0.0033**
COV*SP	1.741589	0.0027**
C	-38.6541	0.2078
Durbin Watson Stat	1.9449	
R-squared	0.427058	

* and ** indicate statistical significance at the 10% and 5 % levels respectively.

HOW MARKETS OF DIFFERENT SECTORS GOT AFFECTED BY COVID-19

Hospitality

- Many states have reinforced local lockdown regulations, which could repeat in 2020.
- This sector comprises restaurants, B&Bs, hostels, service apartments, taverns, bars, and nightclubs.
- The sector contributes much to India's GDP and has been hammered hard by state regulations and curfews.
- Many of these enterprises have shut down since they can only provide basic food. In areas with fewer limitations, footfall has dropped substantially.
- When covid-19 instances rose during the second wave, the hospitality industry in

Maharashtra, the first state to implement tight limits, said it would kill many enterprises.

- Almost all hospitality-related firms face a similar difficulty.
- Many small enterprises may be forced to close permanently due to the second wave's economic impact.

Tourism

- The tourism and travel sector, which employs millions of Indians, bounced back after the first covid wave until the second.
- The tourist sector contributes about 7% of India's GDP and includes hotels, homestays, holiday homes, and motels. The second round of restrictions has damaged the industry, battling to recover from initial losses in 2020.

- Many smaller enterprises may not be able to reopen until the second wave subsides, increasing unemployment and household earnings.

Transportation and Tourism

- Aviation and other travel sector firms struggled during the initial wave of the pandemic.
- Recent reports say plane travel has dropped 50%. People are scared to leave their homes, which hurts the travel industry. While airlines were incrementally increasing revenue margins, the second wave shook things up.

Cars

- The second wave slowed auto sales in the third and fourth quarters of 2021.
- Due to consumer attitude, dealership closures, and supply-side difficulties, many OEMs have advanced maintenance shutdowns to April and May.
- In April 2021, domestic auto sales (excluding commercial vehicles) fell 30% MoM.
- In April 2021, sales of personal vehicles and two-wheelers fell 10% and 34% MoM. Three-wheeler sales fell 57% as shared mobility dropped.
- In April 2021, exports grew 19% MoM, led by a 21% MoM increase in two-wheeler exports.
- The demand for personal vehicles (PV) was the least affected by rising demand in April 2021.
- The domestic personal vehicle market continues to trend towards utility vehicles, which account for 42% of domestic PV sales. Utility vehicle volumes decreased by 11% MoM, and passenger car volumes declined by 10% MoM and 12% from April 2019, driven by a 14% reduction in small car sales.
- In April 2021, motorcycle and scooter sales declined 34% and 33% MoM.
- Schools and colleges being closed in the first quarter have also hurt demand.
- Since cars are discretionary, sales depend on customer emotion.

Construction and Real Estate

- The downturn has devastated demand for Indian homes, according to a report. This has offset developer tax refunds.
- Many migrant workers have left urban areas, disrupting real estate and construction industry activities during the second wave. States where the virus is spreading quickly, where the virus is spreading swiftly, may suffer delays in completing pending projects.
- As migrant laborers return home, building sites are half-staffed.

- Due to the restrictions, builders are also short on materials.
- Real estate and construction could face significant disruption if covid-19 restrictions remain.

Insurers

- The second wave of Covid-19 claims might cost India's health insurance system billions.
- According to the General Insurance Council (GIC), the insurance industry registered 1 million coronavirus claims worth Rs 147.4 bn by 7 April 2021.
- GIC data shows insurers settled 8.6 lakh claims totalling Rs 79.1 bn.

FUTURE

The Indian economy is anticipated to reach 5 trillion dollars by 2025, making it the third largest in the world.

Covid-19's spread caused a quick and historic reduction in economic production, which destroyed the stock market.

The pandemic made 2020 a year of unusual events, including a rapid stock market crash and recovery.

We were in a moment where everyone recognised India's fundamentals, and we still benefited despite having few foreign inflows due to the China problem, which damaged our education sector.

The pandemic made 2020 a year of unusual events, including a stock market meltdown and record-fast recovery. India's growth rates have increased every decade since independence, thanks to its young, ambitious population and expanding income. Developed nations, like Japan or the US, have an elderly population and a slow-growing market. The USA prioritise debt. Savers and investors. The Indian stock market is outpacing the US in post-covid. India's GDP was about USD 2.72 trillion at the time, and the present government's strategy is to grow by 0 to 10% each year from 2020 to 2024. Demonetization, tax cuts, the Insolvency and Bankruptcy Code, privatisation, and other clean-up initiatives were significant long-term steps made by the Indian government.

A stock market illustrates the growth and success of listed enterprises and a country's financial advancement. The up-and-down movement of a financial tool A financial tool's up-and-down movement is influenced by little and large aspects, including tax legislation, climate, and legal framework.

India's market lacks investors. With 1.3 billion people, 4 crores invest in the stock market, which is less than 3% of the population. After post-covid, investors quadrupled after realising the market's potential and returns. This gives us a view of our future market, and

things seem well for long-term investors. With all the market's potential, an investor must assess it from a global perspective and grasp risk and investment objectives to design a safe investment strategy.

CONCLUSION

Our results are consistent with Ashraf (2020), Yilmazkudey (2020), and Barro et al. (2020), who found that stock market performance has dropped due to COVID-19. According to the analysis, several Indian sectors are gaining trading volume but losing average returns because of the perception of a buoyant market after the outbreak. COVID-19 had no substantial impact on the Volatility Index, implying that investors' risk perception dropped, encouraging them to enter the market at low prices and increasing market volumes. Contrary to deteriorating economic factors. Investors love the stock market. People investing more in equities during a recession can potentially indicate a bubble. Due to the Financial sector's poor performance relative to the rest of the economy, average returns may fall shortly.

Pandemic shutdowns have caused a financial crisis in many governments. Companies and the government suffered a financial crunch due to limited or negligible economic activity. As evidenced in our data, companies in lockdown experienced a double-edged sword due to reduced revenue and stock price. Our data also demonstrates a favourable effect of the pandemic on trading volume, which may be due to increased investor confidence. COVID-19 reduced volatility in the Indian stock market, which affects investor confidence. The lower VIX indicates that investors' market confidence increased during the pandemic. Investors may want to enter the market when stock prices are low to profit when India's health and economic crisis ends. Diverting funds from debt-based securities to equities markets in response to RBI's demand-boosting initiatives could also increase investor confidence.

Reduced VIX and higher investor sentiment increased trading activity and volume. This study supports the risk aversion theory. Future research could focus on this effect's behavioural side.

Despite a good showing, the Indian stock market doesn't reflect the economy. It may be excellent news for investors, who can use the NIFTY 50's resiliency to offset losses in other COVID-19-vulnerable asset classes. Positives for policymakers include NIFTY-50 results not reacting much to the outbreak and most sectors gaining trade volume. The work could be expanded by understanding COVID-19's direct causal link to stock market performance.

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