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STATEMENT OF THE PROBLEM
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IMPACT OF PANDEMIC INDUCED LOCKDOWN ON STOCK MARKET PERFORMANCE WITH SPECIAL REFERENCE TO INDIAN EQUITY MARKET

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ABSTRACT

The paper attempts to understand the impact of Pandemic induced lockdown on stock market performance pre and during the lockdown period with special reference to Indian equity market. The following observations were made from the findings of the study. Pandemic induced lockdown seems to have a temporary or short term impact of the stock market performance. Due to lower than the expected earnings coupled with fear of possible economic slowdown, overall sentiment of the market remained negative during the 1st, 2nd and 3rd phase of lockdown. However, the market seemed to have recovered from the pandemic shock during the 4th phase of the lookdown. During pre-lockdown period the Sensex was found to be trading at higher valuations. On the other hand, during lockdown period the market swing from expensive to cheap. However, this trend could not sustain for the longer period as it was observed that during the 4th phase of the lockdown the market was found to be rebounding and market swing from cheap to expensive again. In terms of volatility the market was found to be more volatile during the lockdown period due to negative sentiments towards the equity market. Increase in the foreign portfolio investment coupled with government measures to strengthen the economy boosted the investors' confidence in equity market during the 4th phase of the lockdown.

KEYWORDS

COVID-19, FPI, lockdown, market-cap-to-GDP ratio, pandemic, P/E ratio, sensex, volatility index.

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H24, K34.

INTRODUCTION

During December of 2019, the world became aware of new global-scale threat called at first as corona virus, which changed the lives of millions of people around the globe. The corona virus has multiple impacts regarding public polices, economic production, and population dynamics at macro and micro scale levels across countries, the magnitude of these changes remains unknown since the Corona virus (now called Covid-19) strikes pretty fast at almost every nation of the world (directly or indirectly). [Sheif M. Hassan et.al 2020, (*Submitted for the consideration of EEA Covid-19 project networking. This paper is a part of M&S Research Hub Institute's research project (Covid19 and global Economy)*]. In early and mid-January 2020, the virus started to spread to other Chinese provinces, supported by a huge movement of people towards their hometowns to celebrate Chinese New Year which turned the outbreak into a national crisis. Although Wuhan official announced a complete travel ban in terms of its residents of January 23, the virus still spared quickly. The WHO declared a global emergency due to the rapidly spreading of COVID-19 on January 30, 2019. It's only the sixth time that such type of global emergency has been announced, with past examples including that of the Democratic Republic of Congo Ebola outbreak and the Zika Virus. Chinese scientists linked this disease to a virus family known as corona viruses, which included both the severe acute respiratory syndrome (SARA) virus and the Middle East respiratory syndrome (MERS). (HaiYue Liu et.al Feb 2020). Indian government confirmed first case of COVID-19 on January 30 2020 in Kerala. Following the increase in the number of cases of corona virus in India the prime minister of India on 19th mach 2020 asked all citizens to observe ' Janata Curfew' on 22nd march 2020. Following this event the PM Modi on 24 March announced 21 day lockdown throughout the country. Prime Minister Modi emphasized that the only solution to control the spreading of COVID-19 is to break the chain and practice social distancing.

Ever since COVID-19 strike, markets loom under fear as uncertainty prevails. It has sent markets around the world crashing to levels not witnessed since the Global Financial Crisis of 2008. Following the strong correlation with the trends and indices of the global markets as BSE Sensex and Nifty 50 fell by 38%. The total market cap lost a staggering 27.31% from the start of the year. The stock market has reflected the sentiments this pandemic unleashed upon investors, foreign and domestic alike. Companies have scaled back layoffs have multiplied and employee compensations have been affected resulting in negligible growth in the last couple of months. Certain sectors such as hospitality, tourism and entertainment have been impacted adversely and stock of such companies have plummeted by more than 40% [S Ravi May 2020 *(Impact of COVID-19 on Indian Stock Markets, BW Business World, http://www.businessworld.in/ Accessed on 18 June 2020.)*]

LITERATURE REVIEW

1. **Sehgal, Sanjay & Tripathi, Vanita (2007):** examined if there is value effect in Indian stock market. The study also attempts to identify important sources that cause it. The study found statistically significant value effect using alternative measures such as book to market equity (BE/ME), earnings to price (E/P), cash flows to price (C/P) and dividends to price (D/P). Value effect is found to be significant on unadjusted as well as risk-adjusted return basis. Trading strategy based on value effect is found to be economically feasible.
2. **Sehgal. S and Pandey. A (2010):** The paper attempts to evaluate the equity valuation in India using Price multiples. The samples of study covers 13 prominent sector and data are taken from 145 large companies that satisfy their screening criteria for the period from 1999 to 2007. The findings of the study reveal that "Price-to-earnings provide the best price forecast compared to the other three multiples, price-to-book value, price-to-cash flow and price to sales. Finally, authors recommend that the historical price to earnings (P/E) is the best price multiples for developing price forecast in the Indian environment.
3. **Paramati, Sudharshan Reddy & Gupta, Rakesh (2011):** found that there is a bidirectional relationship between IIP and stock prices (BSE and NSE) and quarterly results reveal that there is no relationship between the GDP and BSE but in case of NSE and GDP there is a unidirectional relationship and that runs from GDP to NSE. The study also confirms that there is a long-run relationship between the stock market performance and the economic growth. Finally, the results of error correction model revel that when the long-run equilibrium deviates then the economic growth adjusts to restore equilibrium by rectifying the disequilibrium.
4. **Masoud, Najeb (2013):** Concludes that there is a positive relationship between efficient stock markets and economic growth, both in short run and long run and there is evidence of an indirect transmission mechanism through the effect of stock market development on investment. They are seen as providing a service that boosts economic growth. The results are consistent with the theoretical and empirical predictions.
5. **Yadav. S (2017):** In his paper, stock market volatility – A study of Indian stock market concludes that "in general over that reference period the bull phase is longer, the amplitude of bull phase is higher and the volatility in bull phase is also higher. The gains during expansions are larger than the losses during the bear phases of the stock market cycles. The bull phase in comparison with its pre liberalization character is more stable in the post liberalization phase. The results of his study show that the stock market cycles have dampened in the recent past. Volatility has declined in the post liberalization phase for both the bull and bear phase of the stock market cycle"

6. **HaiYue Liu et.al (2020):** found that countries in Asia experienced more negative abnormal returns as compared to other countries. Further panel fixed effect regressions also support the adverse effect of COVID-19 confirmed cases on stock indices abnormal returns through an effective channel by adding up investors' pessimistic sentiment on future returns and fears of uncertainties.
7. **Hakan Yilmazkuday (2020):** found that having 1% on an increase in cumulative daily COVID-19 cases in the U.S results in about 0.01% of cumulative reduction in the S&P 500 index after one day and about 0.03% of reduction after one month. Historical decomposition of the S&P 500 Index further suggests that the negative effects of COVID-19 cases in the U.S on the S&P 500 Index have been mostly observed during March 2020.
8. **Gormsen, Niels Joachim and Koije, Ralph S.** J (2020): the study shows how the actual forecast and the bound evolve over time. As of June 8, the researcher stated that their forecast of annual growth in dividends is down 9% in the US and 14% in the EU compares to January 1, and forecast of GDP growth is down by 2.0% in the US and 3.1% in the EU. The lower bound on the change in expected dividends is -18% in the US and -25% in the EU at the 2 –year horizon. Finally, the News about fiscal stimulus around March 24 boosts the stock market and long-term growth but did little to increase short-term growth expectations. Expected dividend growth has improved since April in both the US and the EU.
9. **Enrico Onali (2020):** found that changes in the number of cases and details in the US and six other countries majorly affected by the COVID-19 crisis do not have an impact on the US stock market returns, apart from the number of reported cases for china. However, there is evidence of a positive impact, for some countries, on the conditional hetroscedasticity of the Dow Jones and S&P 500 returns. VAR models suggest that the number of reported deaths in Italy and France have a negative impact on stock market returns, and a positive impact on the VIX returns.
10. **Sivakumari, S & Sudhakar, Suraj & K P, Nitha (2020):** the paper shows the predictive power and valuation accuracy of P/E Model, P/B model and CAPM to know the significance and reliability of the models for Sensex stocks in Indian Stock Market. The study selected a sample of 30 companies which constitutes the BSE sensitive index (Sensex). There are high levels of valuation errors for stocks in India using P/E model and P/B Model. But the valuation accuracy of capital asset pricing model was at high level and can be used for predicting the intrinsic value of Sensex stocks in Indian stock market.

After reviewing the above studies, it is evident that no specific study is undertaken to examine the impact of pandemic induced lockdown on the stocks markets in Indian context. In view of this the present study makes an attempt to study the impact of lockdown due to covid-19 pandemic on the stock market with special reference to equity market in India.

OBJECTIVES OF THE STUDY

The following objectives are set for the present study:

1. To understand the stock market performance in terms of Risk and Return.
2. To understand the valuation of stock market during the study period.
3. To know the amount of foreign portfolio investment in equity market during the study period.

METHODOLOGY

The present study aims to examine the Impact of pandemic induced lockdown on the stock market performance in India. In order to achieve the stated objective, the following method is employed.

Firstly, in order to have comprehensive understanding of the impact of lockdown on the BSE-Sensex the researcher has attempted to study the performance of 30 share index pre and during the lockdown period. For this study the period starting from November-2019 to February 2020 is taken as pre-lockdown period and a period starting from March 2020 to June 2020 is lockdown period.

Secondly, BSE-Sensex is taken as proxy for the stock market performance in India the performance of BSE-Sensex is read in terms of Risk, Return, Valuation, and foreign portfolio investment in equity markets. Risk is measured using S&P BSE Sensex 3-month Realized volatility index. **"**The S&P BSE Sensex 3-Month Realized Volatility index is the first of its kind in India. It provides market participants with accurate measures of the historic volatility of the S&P BSE Sensex over a three-month time horizon. It is synchronized with BSE's three-month futures and options contract expiration cycles and is reset every three months.**"** The monthly data relating to the 3-Month Realized Volatility index is collected and the average value of the same is taken to understand the level of risk or volatility of the stock market. Market returns are calculated by dividing the closing price of the present month by the previous month and deducting one from the result. Price-to-earnings ratio and market-cap-to-GDP ratio is used to measure stock market valuation.

The following table depicts the different bands for understanding the market valuations using Market-cap-to-GDP ratio as measure of market valuation.

TABLE 1

Ratio = Total market Cap/GDP	**Valuation**
Ratio ≤50%	Significantly Undervalued
50% < Ratio≤ 65%	Modestly Undervalued
65%< Ratio≤79%	Fair Valued
79% < Ratio≤93%	Modestly Overvalued

Source: www.gurufoucs.com

SOURCES OF INFORMATION

The data collected for the study is secondary in nature. The data relating to the S&P BSE Sensex 3-month Realized volatility index, Market return, Price-to-earnings ratio is sourced from the official website of the Bombay Stock Exchange. Data relating to the market-cap-to GDP is collected from the website guru focus. Finally, the data on foreign portfolio investment in the equity market in India is taken from the official website of the National Securities Depository Limited (NSDL).

STRUCTURE OF THE STUDY

The present paper is organized into four sections. The first section deals with the introduction. The second section consists of literature reviews, objectives, methodology, and sources of information. Results and analysis are the subject matter of third section. Findings, limitations and conclusion were offered in the last and final section.

RESULTS AND ANALYSIS

TABLE 2: SENSEX MONTHLY RETURNS PRE AND DURING THE LOCKDOWN

Pre-Lockdown period	**High**	**Low**	**Close**	**Return (%)**	**Lockdown Period**	**High**	**Low**	**Close**	**Return (%)**
Nov-19	41163.79	40014.23	40793.81	1.66	Mar-20	39083.17	25638.90	29468.49	-22.85
Dec-19	41809.96	40135.37	41253.74	1.13	April-20	33887.25	27500.79	33717.62	14.42
Jan-20	42273.87	40476.55	40723.49	-1.27	May-20	32845.48	29968.45	32424.10	-3.74
Feb-20	41709.30	38219.97	38297.29	-5.93	June-20	35706.55	32348.10	34915.80	7
Average			**40267.08**	**-1.10**	**Average**			**32631.50**	**-1.29**

Source: Complied and calculated

Table 2 depicts the performance of BSE-Sensex pre and during the lockdown period. It can be observed from the table that during pre-lockdown period the Sensex was trading above forty thousand points. From November 2020 to February 2020 on an average the Sensex was trading at 40267.08 points. It is evident from the table that BSE-Sensex was trading at its all-time high during jan-2020 i.e. 42273.87 points. During the period Nov-19 to Dec-19 Sensex posted positive returns of 1.66 % and 1.13 % respectively. However, by the end of the jan-2020 the covid-19 pandemic had hit the stock exchanges around the world which led to fall in the Sensex return during Jan and Feb 2020. On an average Sensex posted -1.10 returns during the pre-lockdown period. The beginning of the year 2020 i.e. jan-20 and

Feb -2020 witnessed negative returns of -1.27% and -5.93 % respectively. On the other hand, during lockdown period the Sensex fell to its three year low i.e. 25, 6389.90 points during March 2020 and Sensex posted negative return of -22.85%. However, the market seemed to have recovered from the pandemic shock during the month of April 2020 as the Sensex posted 14.99% returns up from -22.85 % during its previous month close. Further it can be observed that due to lower than the expected earnings coupled with fear of possible economic slowdown overall sentiment of the market remained negative during the lockdown period as Sensex on an average gave a return of -1.29% during this period.

TABLE 3: PRICE-TO-EARNINGS RATIO OF SENSEX

Pre-Lockdown Period	P/E	Lockdown Period	P/E
Nov-2020	27.82	Mar-2020	19.55
Dec-2020	27.95	April-2020	18.78
Jan-2020	25.67	May-2020	19.46
Feb-2020	24.64	June-2020	21.82
Average	**26.52**	**Average**	**19.9025**

Source: BSE

Table 3 Historical average Sensex PE ratio from 2007 to 2019 is 20.49. In terms of valuation, during pre lockdown period the Sensex was found to be trading at higher valuations i.e. the price-to-earnings ratio of 30-share index was above its historical average 20.49, generally P/E ratio of 20 and above indicates the over-valuation of the market. On an average the P/E ratio of Sensex during the period from November 2020 to February 2020 was 26.52 signaling overvaluation of the market.

On the other hand, the market corrected during the lockdown period as the price-to-earnings ratio of Sensex during lockdown period was found to be declining. P/E ratio which was trading at above 20 during pre locked period had substantially declined during the pase1, phase2, and phase 3 of the lockdown period i.e. P/E ratio of Sensex during feb-2020 was 24.64, however it declined to 19.55 by the end of March 2020. The average price-to-earnings ratio of Sensex during the lockdown period was 19.90. However, the indices swing from cheap to expensive during the month June 2020 as the P/E was found to be above 20.

TABLE 4: MARKET-CAP-TO-GDP RATIO

Pre-Lockdown Period	M-Cap –to-GDP (%)	Lockdown Period	M-Cap –to-GDP (%)
Nov-2019	73.49	Mar-2020	48.29
Dec-2019	67.61	April-2020	55.26
Jan-2020	66.74	May-2020	53.14
Feb-2020	62.76	June-2020	57.22
Range	**10.73**	**Range**	**8.93**

Source: www.gurufoucs.com

Table 4 depicts the Market –Cap-to-GDP ratio pre and during the lockdown period. The Market-cap-to-GDP ratio is one of the widely used valuation tool to understand whether, the stock market is overvalued or undervalued. Upon observing the table, it is clearly evident the market cap-to GDP ratio during the pre-locked down period was in the band of 65% to 79% indicating that the market was fairly valued. On the other hand, the M-cap-to-GDP ratio during the lockdown period was in the band of 50% to 65%, which indicates the market is modestly undervalued during the lock down period.

TABLE 5: FOREIGN PORTFOLIO INVESTMENT (FPI) IN EQUITY MARKET

Pre-Lockdown Period	FPI (in INR Crores)	Lockdown Period	FPI (in INR Crores)
Nov-2019	25231	Mar-2020	-61973
Dec-2019	7338	April-2020	-6884
Jan-2020	12123	May-2020	14569
Feb-2020	1820	June-2020	20672
Average	**11628**	**Average**	**-8404**

Source: NSDL

Table 5 presents the foreign portfolio investment in equity market pre and during the lockdown period. It can be observed from the above table that during pre-lockdown period on an average the foreign portfolio investment in equity market was 11628 crores. Further it is also observed that during the pre-locked period though the amount invested by Foreign portfolio investors were fluctuating but investors seemed to be to have positive sentiment towards the market. However, the in the beginning of the pahse1 and phase 2 of the lockdown period investors sentiment in equity market turned negative, to speak specifically, the foreign portfolio investment during the period march and April 2020 was -61973 cr and -6884 respectively. Finally, the financial package announced by the central government to overcome the possible economic slowdown due to COVID-19 pandemic seemed to have boosted the investors sentiment which was evident by the amount of foreign portfolio investment made in equity markets during the period May and June 2020, i.e. 14569 cr and 20672 cr respectively.

TABLE 6: S&P BSE-SENSEX 3- MONTHS REALIZED VOLATILITY INDEX

Pre-Lockdown Period	Average 3- Months Realized Volatility index	Lockdown Period	Average 3- Months Realized Volatility index
Nov-2019	6.42	Mar-2020	41.22
Dec-2019	8.13	April-2020	60.02
Jan-2020	9.43	May-2020	43.41
Feb-2020	19.57	June-2020	29.86

Source: BSE

Table 6 depicts the average S&P BSE Sensex 3 months realized volatility pre and during the lockdown period. A High the value of volatility index indicates the high volatility and uncertainty in the market. It is clearly evident from the table that during the pre- lockdown period market was less volatile. To speak specifically, during the period from Nov-19 to Feb 2020 the average 3- months realized volatility index value were 6.42, 8.13, 9.43 and 19.57 respectively. On the other hand the during the lockdown period i.e. from Mar-2020 to June 2020 the market was more volatile as the Average 3- Months Realized Volatility index during the lockdown period i.e. from March 2020 to June 2020 were 41.22, 60.02, 43.41 and 29.86 respectively.

FINDINGS

1. During pre-locked down period on an average the Sensex was trading at 40267.08 points.
2. BSE-Sensex was trading at its all time high during the period jan-2020 i.e. 42273.87 points.
3. During the period Nov-19 to Dec-19 Sensex posted positive returns of 1.66 % and 1.13 % respectively. However, by the end of the jan-2020 the covid-19 pandemic had hit the stock exchanges around the world which led to fall in the Sensex return during Jan and Feb 2020.
4. On an average Sensex posted -1.10 returns during the pre-lockdown period.
5. The beginning of the year 2020 i.e. jan-20 and Feb -2020 witnessed negative returns of -1.27% and -5.93 % respectively.
6. Sensex fell to its three year low i.e. 25, 6389.90 points during March 2020 and Sensex posted negative return of -22.85%.

7. Market seemed to have recovered from the pandemic shock during the month of April 2020 as the Sensex posted 14.99% returns up from -22.85 % during its previous month close.
8. Due to lower than the expected earnings coupled with fear of possible economic slowdown the overall sentiment of the market remained negative during the lockdown period as Sensex on an average gave a return of -1.29% during this period.
9. In terms of valuation, during pre lockdown period the Sensex was found to be trading at higher valuations i.e. the price-to-earnings ratio of 30-share index was above it historical average 20.49
10. On an average the P/E ratio of Sensex during the pre-lockdown period was 26.52 signaling overvaluation of the market.
11. Market corrected during the lockdown period as the price-to-earnings ratio of Sensex during lockdown period was found to be declining.
12. P/E ratio which was trading at above 20 during pre locked period had substantially declined during the pase1, phase2, and phase 3 of the lockdown period i.e. P/E ratio of Sensex during feb-2020 was 24.64, however it declined to 19.55 by the end of March 2020.
13. The average price-to-earnings ratio of Sensex during the lockdown period was 19.90. However, the indices swing from cheap to expensive during the month June 2020 as the P/E was found to be above 20.
14. Market cap-to GDP ratio during the Pre locked down period was in the band of 65% to 79% indicating that the market was fairly valued.
15. Market cap-to-GDP ratio during the lockdown period was in the band of 50% to 65%, which indicates the market is modestly undervalued during the lock down period.
16. During Pre-lockdown period on an average the foreign portfolio investment in equity market was 11628 crores
17. The beginning of the pahse1 and phase 2 of the lockdown period investors sentiment in equity market turned negative, to speak specifically, the foreign portfolio investment during the period march and April 2020 was -61973 cr and -6884 respectively.
18. The financial package announced by the central government to overcome the possible economic slowdown due to COVID-19 pandemic seemed to have boosted the investors sentiment which was evident by the amount of foreign portfolio investment made in equity markets during the period May and June 2020, i.e. 14569 cr and 20672 cr respectively.
19. During the Pre-locked period market seemed to be less volatile as the average 3- months realized volatility index value were 6.42, 8.13, 9.43 and 19.57 respectively. On the other hand the during the lockdown period i.e. from Mar-2020 to June 2020 the market was more volatile as the Average 3- Months Realized Volatility index during the lockdown period i.e. from March 2020 to June 2020 were 41.22, 60.02, 43.41 and 29.86 respectively.

CONCLUSION

The paper attempts to understand the impact of Pandemic induced lockdown on stock market performance pre and during the lockdown period with special reference to Indian equity market. The study found that Due to lower than the expected earnings coupled with fear of possible economic slowdown overall sentiment of the market remained negative during the 1st, 2nd and 3 rd phase of lockdown. However, the market seemed to have recovered from the pandemic shock during the 4th phase of the lookdown. During pre-lockdown period the Sensex was found to be trading at higher valuations. On the other hand, during lock down period the market swing from expensive to cheap. However, this trend could not sustain for the longer period as it was observed that during the 4th phase of the lockdown the market was found to be rebounding and market swing from cheap to expensive. Further, in terms of volatility the market was found to be more volatile during the lockdown period due to negative sentiments towards the equity market. In Nutshell, pandemic induced lockdown seems to have a temporary or short term impact of the stock market performance as the market sentiment was found to be negative during the Phase1, Phase2, and Phase3 of the lockdown period. However, market was found to be rebounding during the fourth phase of lockdown. Further it was also observed that increase in the foreign portfolio investment coupled with government measures to strengthen the economy boosted the investors' confidence in equity market.

LIMITATIONS

Following are some of the major limitations of the study

1. Foreign portfolio investment in Debt market is not considered in the present study
2. BSE-Sensex is considered as a proxy for stock market performance, while other index such as NIFTY-50 is not considered.
3. Only equity segment is taken to understand the stock market performance, while derivatives and commodity segment is ignored.

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