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INVESTOR'S PERCEPTIONAL VARIANCE AND THE COVID-19 PANDEMIC: AN EMPIRICAL STUDY

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Abstract

The whole world have become standstill and different in just a few months' time due to the effect of the corona virus pandemic. The corona virus not only affected human life but the society as a whole in different aspects. The pandemic created lockdown affected the economy from losing jobs to falling market capitalization and several other factors associated with it. In a situation like this where every aspect of the society is getting affected due to the pandemic, we as a researcher should look upon on the societal aspect for the benefit of the society especially in this pandemic period. Such financial market disruptions will have negative impact on the investors' perception. Therefore, under this study, the researchers have conducted an empirical analysis of the changes in several NSE indexes' values in pre pandemic lockdown and lockdown period by applying One-Tailed Paired t-test for means. The observations are quite clear that the investors' perception has turned negative. Several recommendations have also been provided by the researchers to bring the market back to normalcy and to escort the confidence of investors. The specific causes behind such perceptual changes among investors along with future research scope have also been identified by the researchers.

Keywords: Pandemic, Market Cap, NSE Indexes, Perceptual Variance.

JEL Classification: C12, C88, D53, G41, Y10.

INTRODUCTION

BACKGROUND OF THE STUDY

The Covid-19 pandemic has impacted almost all sectors and the whole world at this point of time is going through a tough situation which was hardly faced earlier. The implementation of the lockdown had been done to curb the spread of corona virus which is looking as the only possible solution till now. But in a prospering economy like India, complete shutdown of economic activities can't be the feasible solution as the economy will be staged and several sectors will be effected which will hamper the growth of an economy as a whole. The investors are losing their confidence down at this point of time due to the spreading of the pandemic which has also shaved nearly one third of the final market cap. Therefore, the whole economy is going through a downward trend at this point of time which will in turn change the perception and behavioral aspect of the investors in a negative way. Investor's sentiments influence the stock markets significantly and investors take their decisions emotionally rather than rationally when there is a panic situation like these. Hence, it's significant for the social science researchers to understand the perception of investors as a slight negative or positive change can affect the market at large.

REVIEW OF LITERATURE

John, J.K, Amudha, R & Sudhahar, J.C. (2019) studied that the sectoral indices like Energy, Bank, Financial services are more volatile than the defensive sectoral indices like IT and Pharma. The researchers concluded that Pharma sector deemed to be better than other sectoral indices in terms of highest return with the lowest volatility which could be the best choice for the long-term investment from the investor's point of view. They also found that there is a leverage effect in the sectoral indices.

Bhattacharjee, A. & Das, J. (2020) in their research titled 'COVID-19 and the Indian Stock Market Mayhem' investigated the initial impact of COVID-19 outbreak on Indian stock market. The impact on stock market is measured by analyzing the trend of the 8 Indian stock market indices, behavior of FIIs and DIIs, developments in the Indian IPO market and response of the market regulators to control the crisis.

Pareek, S. & Singh, K. (2020) in their study titled 'Covid-19 and its Initial Signaling Effects on the Stock Market in India' indicated that India's economy is highly integrated with world economy. Their exploratory study shows that there exists a strong negative correlation between number of Covid-19 patients and closing SENSEX index value, which is statistically significant.

RESEARCH GAP

Based on extensive review of literature, researchers have found that there is lack of any definite study for gaining an in-depth knowledge regarding investors' perception with reference to the impact of current pandemic of the on indices behavior. Considering this as a major research gap and having a considerable socio-economic significance; the researchers choose to fill up the gap through below defined research objectives, by conducting a descriptive, analytical and explorative research.



RESEARCH OBJECTIVES

Based on the research gap, the researchers have identified the following research objectives:

1. To know whether there is any change in the investors’ perception regarding country’s overall industrial growth prospects in the lockdown period with respect to NSE Nifty 50 index.
2. To know whether there is any change in the investors’ perception regarding auto sector in the lockdown period with respect to NSE Nifty Auto index.
3. To know whether there is any change in the investors’ perception regarding financial services sector in the lockdown period with respect to NSE Nifty Financial Service index.
4. To know whether there is any change in the investors’ perception regarding FMCG sector in the lockdown period with respect to NSE Nifty FMCG index.
5. To know whether there is any change in the investors’ perception regarding metals sector in the lockdown period with respect to NSE Nifty Metal index.

RESEARCH QUESTIONS

Based on the well-defined research objectives, following research questions have been formulated:

1. Does the investors’ perception regarding country’s overall industrial growth prospects changes in the lockdown period with respect to NSE Nifty 50 index?
2. Does the investors’ perception regarding auto sector changes in the lockdown period with respect to NSE Nifty Auto index?
3. Does the investors’ perception regarding financial services sector changes in the lockdown period with respect to NSE Nifty Financial Service index?
4. Does the investors’ perception regard FMCG sector changes in the lockdown period with respect to NSE Nifty FMCG index?
5. Does the investors’ perception regarding metals sector changes in the lockdown period with respect to NSE Nifty Metal index?

RESEARCH HYPOTHESIS

The following research hypothesis has been formulated based on the research objectives:

1. H₀₁: There are no significant perceptual changes among the investors regarding country’s overall industrial growth prospect in the lockdown period.
2. H₀₂: There are no significant perceptual changes among the investors regarding automobile sector in the lockdown period.
3. H₀₃: There are no significant perceptual changes among the investors regarding financial services sector in the lockdown period.
4. H₀₄: There are no significant perceptual changes among the investors regarding FMCG sector in the lockdown period.
5. H₀₅: There are no significant perceptual changes among the investors regarding metals sector in the lockdown period.

RESEARCH METHODOLOGY

The present study is based on the empirical analysis of secondary data collected from reliable source. The study focuses on how investor perception changes regarding industry prospects in reference to the Covid-19 pandemic and resultant lockdown, through empirical analysis of index and indices value changes. Under this study pre lockdown and lockdown closing index values of NSE Nifty 50, Nifty AUTO, Nifty Financial Services, Nifty FMCG and Nifty Metals have been taken from the official website of NSE for the purpose of analysis. The study window is of twenty days pre lockdown and twenty days lockdown period. The pre lockdown period is chosen from 24-02-2020 to 23-03-2020 and the lockdown period is considered from 25-03-2020 to 27-04-2020. 24th March values have been ignored under the present study as not all of the states-imposed lockdown on that day. The paired closing index values collected of the above-mentioned indices are then analyzed and presented using two sample paired t test for means through MS Excel 2010. Under this study parametric test has been used because the stock market data, basically index values follow normal distribution in a smaller timeframe under any specific socio-economic condition. The results drawn from the test are analyzed to draw conclusions to fulfil the research objectives.

The researchers have taken NSE Nifty 50 index as it is a comprehensive benchmark index which represents the growth prospects of the industrial sector and the health of the economy at large. The Nifty 50 index is a combination of 50 top performing stocks belonging to almost all the sectors and hence the researchers on the best judgement has assumed the index to be a representative of overall growth prospects. The motive behind choosing automobile sector index is due to the fact that this sector was under depression for the economic slowdown since the beginning of the year 2020 and the nationwide lockdown had worsened the situation. The financial services sector index has been taken for the purpose of analysis because it is evident that the demand for this sector has drastically declined due to the pan India lockdown. Nifty FMCG index has been taken as it is evident that it is the only sector whose demand has remained unaffected in the lockdown period. Nifty metals index is taken for the purpose of analysis under this study because the demand for it has significantly declined due to suspension of industrial activities.



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DATA PRESENTATION AND ANALYSIS

To fulfill the research objectives and to answer the research questions based on the above well-defined research methodology, data regarding select NSE indexes' values pre lockdown and lockdown are presented and analyzed below by applying twosample paired t test for means.

Table 1: Prelockdown period and lockdown period NSE Nifty 50 daily closing values (in Rs.)

Table with 4 columns: Pre Lockdown Period (DATE, INDEX VALUES (Rs.)), Lockdown Period (DATE, INDEX VALUES (Rs.)). Rows show daily closing values from 24-Feb-20 to 27-Apr-20.

Source: https://www1.nseindia.com/products/content/equities/indices/historical_index_data.html

Analysis

H01: There are no significant perceptual changes among the investors regarding country's overall industrial growth prospect in the lockdown period.

H11: There are significant perceptual changes among the investors regarding country's overall industrial growth prospect in the lockdown period.

Table 2: t-Test: Paired Two Sample for Means. Table with 3 columns: Statistic, Pre-Lockdown Period, Lockdown Period. Rows include Mean, Variance, Observations, Pearson Correlation, Hypothesized Mean Difference, df, t Stat, P(T<=t) one-tail, t Critical one-tail, P(T<=t) two-tail, t Critical two-tail.

Source: Computed through Microsoft Excel 2010



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It has been observed from the above table that t Stat (=3.912) > t Critical one-tail (=1.729), with a P value of 0.000 (P < 0.05 & P < 0.01). Hence the Ho (Null Hypothesis) is rejected both at 5% and 1% level of significance. The investors' perception turns negative regarding overall industrial growth prospect in the lockdown period. This outcome is confirmed by the mean index values of Pre-Lockdown and Lockdown period. The mean index value Pre-Lockdown (=10289.698) > Pandemic Lockdown period (=8842.438).

Table 3: Pre lockdown period and lockdown period NSE Nifty AUTO daily closing values (in Rs.)

Pre Lockdown Period		Lockdown Period	
DATE	INDEX VALUES (Rs.)	DATE	INDEX VALUES (Rs.)
24-Feb-20	7429.1	25-Mar-20	4936.15
25-Feb-20	7366	26-Mar-20	5061.3
26-Feb-20	7207.95	27-Mar-20	4938.7
27-Feb-20	7178.85	30-Mar-20	4669.15
28-Feb-20	6903.95	31-Mar-20	4731.3
2-Mar-20	6856.9	1-Apr-20	4657.55
3-Mar-20	6986.65	3-Apr-20	4517.75
4-Mar-20	6938.85	7-Apr-20	4951.55
5-Mar-20	6953.75	8-Apr-20	5043.6
6-Mar-20	6895	9-Apr-20	5568.45
9-Mar-20	6632.15	13-Apr-20	5432.1
11-Mar-20	6568.45	15-Apr-20	5333
12-Mar-20	6033.4	16-Apr-20	5394.15
13-Mar-20	6182	17-Apr-20	5668.9
16-Mar-20	5843.7	20-Apr-20	5591
17-Mar-20	5803.85	21-Apr-20	5294.05
18-Mar-20	5516.5	22-Apr-20	5426.85
19-Mar-20	5180.5	23-Apr-20	5464.75
20-Mar-20	5370.15	24-Apr-20	5377.25
23-Mar-20	4626.5	27-Apr-20	5433.2

Source:https://www1.nseindia.com/products/content/equities/indices/historical_index_data.html

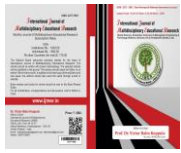
Analysis

H02: There are no significant perceptual changes among the investors regarding automobile sector in the lockdown period.

H12: There are significant perceptual changes among the investors regarding automobile sector in the lockdown period.

Table 4: t-Test: Paired Two Sample for Means		
	Pre lockdown Period	Lockdown Period
	INDEX VALUES (Rs.)	INDEX VALUES (Rs.)
Mean	6423.71	5174.538
Variance	646944.934	122395.168
Observations	20	20
Pearson Correlation	-0.642	
Hypothesized Mean Difference	0	
df	19	
t Stat	5.254	
P(T<=t) one-tail	0.000	
t Critical one-tail	1.729	
P(T<=t) two-tail	0.000	
t Critical two-tail	2.093	

Source:Computed through Microsoft Excel 2010



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It has been observed from the above table that t Stat (=5.254) > t Critical one-tail (=1.729), with a P value of 0.000 (P < 0.05 & P < 0.01). Hence the Ho (Null Hypothesis) is rejected both at 5% and 1% level of significance. The investors' perception turns negative regarding automobile sector in the lockdown period. This outcome is confirmed by the mean index values of Pre-Lockdown and Lockdown period. The mean index value Pre-Lockdown (=6423.71) > Pandemic Lockdown period (=5174.538).

Table 5: Pre lockdown period and lockdown period NSE Nifty Financial Services daily closing values (in Rs.)

Pre Lockdown Period		Lockdown Period	
DATE	INDEX VALUES (Rs.)	DATE	INDEX VALUES (Rs.)
24-Feb-20	14236.15	25-Mar-20	9203.3
25-Feb-20	14236.1	26-Mar-20	9698.55
26-Feb-20	14132.7	27-Mar-20	9754.3
27-Feb-20	14086.05	30-Mar-20	9030.65
28-Feb-20	13566.45	31-Mar-20	9317.3
2-Mar-20	13520	1-Apr-20	8942.55
3-Mar-20	13636.95	3-Apr-20	8562.1
4-Mar-20	13439.5	7-Apr-20	9278.3
5-Mar-20	13472.75	8-Apr-20	9243.45
6-Mar-20	13082.5	9-Apr-20	9803
9-Mar-20	12522.2	13-Apr-20	9500.65
11-Mar-20	12560.45	15-Apr-20	9239.35
12-Mar-20	11454.8	16-Apr-20	9392.6
13-Mar-20	12101.6	17-Apr-20	9905.55
16-Mar-20	11123.4	20-Apr-20	9930.65
17-Mar-20	10613.6	21-Apr-20	9468.8
18-Mar-20	9800.3	22-Apr-20	9569.2
19-Mar-20	9598.35	23-Apr-20	9808.95
20-Mar-20	9871.95	24-Apr-20	9431.85
23-Mar-20	8298.5	27-Apr-20	9627.6

Source: https://www1.nseindia.com/products/content/equities/indices/historical_index_data.html

Analysis

H03: There are no significant perceptual changes among the investors regarding financial services sector in the lockdown period.

H13: There are significant perceptual changes among the investors regarding financial services sector in the lockdown period.

Table 6: t-Test: Paired Two Sample for Means		
	Pre lockdown Period	Lockdown Period
	INDEX VALUES (Rs.)	INDEX VALUES (Rs.)
Mean	12267.715	9435.435
Variance	3302369.71	121639.174
Observations	20	20
Pearson Correlation	-0.411	
Hypothesized Mean Difference	0	
df	19	
t Stat	6.377	
P(T<=t) one-tail	0.000	
t Critical one-tail	1.729	
P(T<=t) two-tail	0.000	
t Critical two-tail	2.093	

Source:Computed through Microsoft Excel 2010



It has been observed from the above table that $t_{Stat} (=6.377) > t_{Critical\ one-tail} (=1.729)$, with a P value of 0.000 ($P < 0.05$ & $P < 0.01$). Hence the H_0 (Null Hypothesis) is rejected both at 5% and 1% level of significance. The investors' perception turns negative regarding financial service sector in the lockdown period. This outcome is confirmed by the mean index values of Pre-Lockdown and Lockdown period. The mean index value Pre-Lockdown ($=12267.715$) > Lockdown period ($=9435.435$).

Table 7: Pre lockdown period and lockdown period NSE Nifty FMCG daily closing values (in Rs.)

Pre lockdown period		Lockdown Period	
DATE	INDEX VALUES (Rs.)	DATE	INDEX VALUES (Rs.)
24-Feb-20	30147.6	25-Mar-20	24471.7
25-Feb-20	30173.2	26-Mar-20	25680.1
26-Feb-20	29965.55	27-Mar-20	25740.45
27-Feb-20	29981.2	30-Mar-20	25831.55
28-Feb-20	29310.25	31-Mar-20	27319.2
2-Mar-20	29138.9	1-Apr-20	26358.8
3-Mar-20	29406.2	3-Apr-20	26537.75
4-Mar-20	29223.75	7-Apr-20	28745.3
5-Mar-20	29530.5	8-Apr-20	28839.9
6-Mar-20	28937	9-Apr-20	28953.2
9-Mar-20	28056.5	13-Apr-20	28509.85
11-Mar-20	28078.75	15-Apr-20	29686.95
12-Mar-20	26083	16-Apr-20	29512.3
13-Mar-20	26208	17-Apr-20	29202.35
16-Mar-20	24707.65	20-Apr-20	28598.1
17-Mar-20	24929.85	21-Apr-20	28480.6
18-Mar-20	24186.5	22-Apr-20	29185.15
19-Mar-20	23970.75	23-Apr-20	28786.25
20-Mar-20	25931.6	24-Apr-20	28636.7
23-Mar-20	23184.05	27-Apr-20	29052.55

Source: https://www1.nseindia.com/products/content/equities/indices/historical_index_data.html

Analysis

H_{04} : There are no significant perceptual changes among the investors regarding FMCG sector in the lockdown period.

H_{14} : There are significant perceptual changes among the investors regarding FMCG sector in the lockdown period.

	Pre lockdown Period	Lockdown Period
	INDEX VALUES (Rs.)	INDEX VALUES (Rs.)
Mean	27557.54	27906.438
Variance	5701449.704	2415334.592
Observations	20	20
Pearson Correlation	-0.657	
Hypothesized Mean Difference	0	
df	19	
t Stat	-0.433	
P(T<=t) one-tail	0.335	
t Critical one-tail	1.729	
P(T<=t) two-tail	0.670	
t Critical two-tail	2.093	

Source: Computed through Microsoft Excel 2010



It has been observed from the above table that $t_{Stat} (-0.433) < t_{Critical\ one-tail} (1.729)$, with a P value of 0.335 ($P > 0.05$ & $P > 0.01$). Hence the H_0 (Null Hypothesis) is accepted both at 5% and 1% level of significance. The investors' perception does not change regarding FMCG sector in the lockdown period. Rather there is a positive approach of investors regarding this sector. This outcome is confirmed by the mean index values of Pre-Lockdown and Lockdown period. The mean index value Pre-Lockdown (=27557.54) > Lockdown period (=27906.438).

Table 9: Pre lockdown period and lockdown period NSE Nifty Metal daily closing values (in Rs.)

Lockdown Period		Lockdown Period	
DATE	INDEX VALUES (Rs.)	DATE	INDEX VALUES (Rs.)
24-Feb-20	2469.6	25-Mar-20	1541.2
25-Feb-20	2470.35	26-Mar-20	1542.95
26-Feb-20	2430	27-Mar-20	1554.85
27-Feb-20	2410.05	30-Mar-20	1507.7
28-Feb-20	2246.05	31-Mar-20	1585.9
2-Mar-20	2197.6	1-Apr-20	1553.55
3-Mar-20	2320.75	3-Apr-20	1522.9
4-Mar-20	2304.3	7-Apr-20	1637
5-Mar-20	2284.85	8-Apr-20	1624.85
6-Mar-20	2183.9	9-Apr-20	1705.45
9-Mar-20	2020.05	13-Apr-20	1738.4
11-Mar-20	1986.95	15-Apr-20	1752.9
12-Mar-20	1800.6	16-Apr-20	1779.75
13-Mar-20	1903.35	17-Apr-20	1816.5
16-Mar-20	1730.6	20-Apr-20	1756.45
17-Mar-20	1710.45	21-Apr-20	1666.6
18-Mar-20	1664.2	22-Apr-20	1673.3
19-Mar-20	1574.2	23-Apr-20	1694.75
20-Mar-20	1692.85	24-Apr-20	1645.2
23-Mar-20	1496.45	27-Apr-20	1666.6

Source: https://www1.nseindia.com/products/content/equities/indices/historical_index_data.html

Analysis

H_{05} : There are no significant perceptual changes among the investors regarding metal sector in the lockdown period.

H_{15} : There are significant perceptual changes among the investors regarding FMCG sector in the lockdown period.

	Pre lockdown period	Lockdown Period
	INDEX VALUES (Rs.)	INDEX VALUES (Rs.)
Mean	2044.858	1648.34
Variance	105928.157	8599.915
Observations	20	20
Pearson Correlation	-0.670	
Hypothesized Mean Difference	0	
df	19	
t Stat	4.504	
P(T<=t) one-tail	0.000	
t Critical one-tail	1.729	
P(T<=t) two-tail	0.000	
t Critical two-tail	2.093	

Source: Computed through Microsoft Excel 2010



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It has been observed from the above table that $t_{Stat} (=4.504) > t_{Critical\ one-tail} (1.729)$, with a P value of 0.000 ($P < 0.05$ & $P < 0.01$). Hence the H_0 (Null Hypothesis) is rejected both at 5% and 1% level of significance. The investors' perception turns negative regarding metal sector in the lockdown period. This outcome is confirmed by the mean index values of Pre-Lockdown and Lockdown period. The mean index value Pre-Lockdown ($=2044.858$) $>$ Lockdown period ($=1648.34$).

CONCLUSION

On the basis of above analysis of the selected indices it is evident that the overall perception of the investors have turned negative towards the securities market and the overall growth prospects of the industrial sector of the economy. NSE Nifty 50 index is a benchmark index which consists of the top performer companies belonging to all the sectors of the economy. The overall investors' perception turns negative towards the index represents that investors' confidence has declined towards the market in narrow sense and towards the industrial growth prospects in broader sense. A severe shutdown of economic activities and industrial units for more than two months has resulted in negative approach towards almost all the sectors of the market. This is clearly evident from the behavior of the above selected indices except for FMCG sector.

The automobile sector was experiencing a downfall since the beginning of the year 2020 due to the economic slowdown. The pandemic has worsened the situation. This is evident from the above analysis of the Nifty AUTO index that the investors' perception has turned negative in the lockdown period. This is due to the fact that there is a drastic fall in the demand of products of automobile sector. The same reason is feasible for metals sector. Due to extended shutdown of the industrial units, the demand for metals, especially for heavy metals used by capital goods industry has significantly declined. This sector reported for considerable losses. This has resulted in negative perception of investors towards this index. In case of financial services, the demand for these kinds of services has declined and the reason is same. The requirement for funds for operations of the industries and individuals has dwindled and as a result the requirement for financial services have spurned. But in case of FMCG sector, the perception of investors has not changed. Rather, it is evident from the above analysis that the perception has turned positive for this sector. The reason behind such shift is that the FMCG sectors revenues have not declined in the lockdown period. The demand for products related to the FMCG sector has remained stable. This has created a positive impact on the mindsets of the investors towards this sector.

RECOMMENDATION

Based on the extensive analysis of the behavior of the select NSE indices and the conclusions drawn, the researchers observed that the sentiments of the investors have turned negative. It is anticipated that the world stock markets have experienced a down trail of nearly 50% in this pandemic situation. This bearish trend is evident in Indian securities market also. The fear for further downfall of the market has resulted in excessive selling pressure on the stocks and indices has resulted in huge losses of investors. There are many reasons for such behavior of the investors but the prominent one is herd instinct. The negative wave of the Covid-19 pandemic has also impacted the thought process and sentiment of the investors. On the basis of above discussion, the researchers recommend that for short term investors it is the time to square off their position only if they have a cash crunch and are incapable of bearing the risks associated in this pandemic situation. It is correctly said that the stock market is a zero-sum game. It is the short sellers who have gained considerable profits from, this pandemic situation. For long term investment, it is strongly suggested for the investors to hold the current position. This is the favorable time for the long-term investors to enter the market and to build strong portfolios for better returns. The fall off situation in the indices is temporary and will definitely recover in the near future.

LIMITATION AND FUTURE RESEARCH SCOPE

The study is extensively based on analysis of data for a shorter time frame. There is an enormous purview of the study. The present study is conducted on very limited select indices. The research work can be extended by selecting more such indices for longer time frame and using more sophisticated statistical tools and mathematical techniques. Moreover, the behavioral aspect of the investors can be assessed using primary survey under the preview of behavioral finance.

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