A Study to analyse effect of COVID-19 on selected IT Stock

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ABSTRACT

The aim of this research is to study how COVID-19 outbreak has affected main Information Technology shares listed with the National Stock Exchange of India. We have decided on ten IT corporations indexed with NSE and the choice became purely based available in the marketplace capitalization of the corporations. The widespread hypothecation of this observation became was the IT shares will flow towards the overall marketplace trend. The study period was classified into the pre-crisis period and the Covid-19 crisis period. The data consists of 125 daily price observations of the selected ten IT companies. The period of study is ranging from 1st October 2019 to 31st March 2020. The results reported that the momentum effect is persisting with IT stocks as the IT stocks are moving in accordance with the general benchmarking index. This study also signifies that companies like Wipro Limited and Mindtree Limited with a strong brand reputation seem to be sustaining in the crisis period in spite of the general falling market trend. This paper has strongly urged the need for backward integration and enhanced research and development activities to the Indian Information Technology sector for ensuring their sustainable long-run operations.

Keywords

Coronavirus, stock market, National Stock Exchange (NSE), crisis, Nifty, winner stocks, loser stocks.

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1. Introduction

The novel Corona-virus disease (Covid-19) has speedily advanced from a provincial health scare to a worldwide meltdown. While it has brought almost half of the sector to a standstill it has affected the financial markets in unseen methods through eroding one-fourth of health in almost a month. This paper investigates the response of the National Stock Exchange (NSE, India) in terms of their decline and volatility as Corona-virus epicenter moved from China to Europe after which to the US and India. The Coronavirus (COVID-19) flare-up in December 2019 in Wuhan (China), As of May 10, 3,925,815 cases of COVID-19 and 274,488 deaths from 215 countries have been reported to the WHO (Rajesh Bhatia, 2020)

The scale and direction of the spread have driven the World Health Organization (WHO) to announce Covid-19 right off the bat as a worldwide crisis on February 20, 2020, and afterward a pandemic on eleventh March 2020.

The entire globe has witnessed numerous monetary slowdown in the previous decades, inclusive of the USA financial savings and mortgage disaster of 1980s, the extended monetary downturn in the Japanese economic system in 1990s, the Asian monetary disaster in

the latter portion of 1990s, the issues followed by the crash of the Dotcom Bubble in the early a part of the 1990s and the USA subprime loan disaster among 2007 and 2010.

Each of these problems were accompanied by unfavourable results to the economies of all the nations involved and takes couple of years of adjustments of concrete economic and regulatory policies for the regions affected to bring it back to the stability like before. On one hand it is very normal and expected for the these crisis to happen and various economies which are affected to recover slowly and subsequently, it no doubt leads to the economic and monetary losses of the economies involved.

In numerous recent articles referring to the effect of the Covid-19 outbreak, numerous industries including Travel, Tourism, Entertainment, Hotels, and Airline commercial enterprise is mentioned. However, IT industries can play a crucial position at some stage in the duration of a lockdown, due to the boom in "work from home" and "social distancing". These two things (Work from your home and maintaining social distancing) has ended up the buzzwords in today's business landscape, with the telecom area being the invisible hand riding this shift. Remote working, video conferencing, and telecommunications

generation have quickly emerged as key enablers for enterprise operations at some stage in this lockdown, and streaming offerings including Netflix have ended up the go-to source for entertainment, placing the telecom sector in highlight today. While going via the formerly published literature, it's far observed that the researchers did now no longer placed plenty of attention at the IT industry at some stage in the coronavirus duration. This led us to perform studies on the impact of Covid-19 on IT shares listed with NSE. Initially, while Covid-19 reported in China at some stage in November 2019, the benchmarking stock index in India, the nifty, however, looks like to be solid or advantageous because the disaster in China probably to foster the domestic business enterprise. The COVID-19 pandemic has unfolded for a count of almost greater than fifty-nine nations since December, inclusive of India's economy. Gradually the nifty started to fall because of the variety of confirmed cases of coronavirus speedy growth in the country. This analysis is based on the theoretical model given by Fama (1970). According to this, market information plays a vital role in forming investment decisions. He conveyed that 'markets are rational and efficient investors react to both positive and negative news'. And therefore, on this basis, he identified two investment strategies viz. Contrarian strategy (investors move in a direction just opposite to the market movements) and Momentum strategy (investors move in accordance with the general market trend). According to the former (i.e. contrarian) strategy, the investors react too much to the available information, unlike the latter (i.e. momentum) strategy, where the investors do not react in that pace to market data available about the stocks or the market. This theoretical postulation is on the ground that we have to check how the investors react to IT stocks during the Covid-19 outbreak. The mathematical testing of this research is based on the model proposed by Aravind (2016). The primary focus of this research is to find out the presence of the effects of the two strategies (i.e. the momentum and the contrarian strategy) on the IT stocks listed with NSE. For getting a detailed outlook, the study period is divided into the precrisis period (October 2019 to December 2019) and the crisis period (January 2020 to March 2020).

2.LITERATURE REVIEW

Coronavirus is deemed to be transmitted from animals to humans and first reported in China in 2019 (Arul, 2019). At present, there is no existence of antiviral drugs for the treatment of Covid-19 infections (Yethindra, 2020). The IT sector in India which is overly dependent on China for electronic goods and intermediary products needed to provide services. As an impact of COVID 19, this industry is seriously facing disruption of demands.

Whereas the stock marketplace has witnessed panic sell-off stocks because the country has shown its first Covid-19 demise and the wide variety of tremendous instances in the country neared eighty as on 13th March 2020.

Anything associated with the software system, computers, networking, intranets, websites, and telecommunications falls beneath the Information Technology sector. Information Technology is the era which facilitates corporations to store the information, process the information, and glide information inside the organization. This sector in the end provides services to other sectors like Banking sector, Manufacturing sector, Telecom sector, Hotel industry, Healthcare sector, etc. to enhance their performance and boom their sales via client interaction and satisfaction. Therefore, at the time of this pandemic and lockdown, the above-mentioned sectors reduced their work and hence their demand for IT products decreased, hence affecting the stock prices of IT sector companies. The sector has helped Asian country rework from a rural and agriculture-based economy to a knowledge-based economy. Besides this, the lives of individuals are absolutely influenced by the direct or indirect contribution of IT sector to numerous parameters.

(Assogbavi & L. A., 2005) Conducted research to explore how past information can impact trading performance in the Canadian market. It was found that there exists a strong proof that holds up the strategy called momentum strategy, which implies buying previous winner stocks/shares and selling past loser stocks/shares. According to (Schiereck, 1999), equity prices are reflected by the investor's assessment of future companies' profit.

Since very few research papers directly related to the Information Technology sector have been published, we have tried to use the studies related to the Pharmaceutical sector with respect to the Indian economy and applied the same theories on the IT sector too at the coronavirus times. Hence, we took the Pharmaceutical sector as our base and computed all the calculations on the basis of that. We used Pharmaceutical industry because this sector was much in demand during crisis and much volatility was also present, and hence we used the researches related to Pharmaceutical sector for the IT sector too. We have used the daily return of the ten stocks of the IT sector mentioned from the NSE website and computed all the calculations on the basis of that.

(Pandya, 2017) in his paper conveyed that a contrarian strategy can bring more profit to the investors both in the short and long run. In this analysis we have tried to use (Aravind, 2016) study in case of some IT stocks too, in which he points that momentum strategy seems to be suitable for Pharmaceutical stocks based on short term information, whereas for long investment decision contrarian strategy can generate more to the investors. Contemporary news can influence the movement of IT stocks in the short run. According to (Hwang, 2013), 'Stock return underperformance because of terrible activities is too large in measurable quantity and remains a bit longer than the abnormal gains/losses because of favourable events'. In the context of our study, the unpleasant news of Covid-19 should positively hit Information Technology sector stocks.

(Mohammad Noor, 2020) his paper investigates the effect of the lockdown duration as a result of the coronavirus pandemic on the stock exchange market of India. The research investigates the quantity of the effect of the coronavirus lockdown at the stock market of India and if the marketplace response will be identical in pre- and post COVID lockdown duration. He used the Market Model Event study method for the research. A small sample of 31 organizations indexed on the Bombay Exchange Stock (BSE) is randomlypicked for the cause of the examination. The crisis is the official announcement of the lockdown. The effects imply that the marketplace reacted positively with considerably positive and good Average Abnormal Returns throughout the prevailing lockdown duration, traders predicted the lockdown and reacted in a positive direction, while before the lockdown duration investors panicked and it was contemplated in terrible average abnormal returns.

(Stijn Baert, 2020) in his paper conveyed that how teleworking has attributed positively to the individuals by increasing their work efficiency and also reducing their risk of burnout. It also conveyed that majority of employees thinks that teleworking covering almost 85% and digital conferencing covering almost 81% are going to stay here in the future.

(KIM, 2017)in his paper mentions innovation techniques of IT businesses of the USA and South Korea. The study proves the effective manner to apply examination and taking advantage for a very long tenure via way of means of accumulating and examining Information Technology businesses from NASDAQ (National Association of Securities Dealers Automated Quotations) and KOPSI (Korea Stock Exchange Composite).

3. RESEARCH METHODOLOGY

3.1 RESEARCH OBJECTIVES

 To study the returns generated by selected IT stocks in pre and during coronavirus crisis.

3.2 METHODOLOGY

This research covers everyday/daily returns data of ten leading IT stocks enlisted with the National Stock Exchange (NSE). They are Wipro Limited, Tata Consultancy Services Limited, Infosys Limited, NIIT Tech, HCL Limited, Mindtree Limited, Larsen & Toubro Infotech Limited, Tech Mahindra Limited, Info Edge India Limited and MphasiS Limited.

These companies were selected based on their respective market capitalization as shown in Table 1. The daily return data of the selected stocks from 1st October 2019 to 31st march 2020 was duly considered for this research. It consists of 125 daily price observations of 10 IT companies (i.e. 125*10 observations) listed with NSE. Likewise, the NIFTY return for the above time period was calculated.

For a better representation of results, the performance of IT stocks from October 2019 to December 2019 was taken as the pre-crisis period. It consists of 61 daily observations of each 10 companies. As mentioned in the literature coronavirus first reported in India in January 2020, thereby we have classified the price observations from January 2020 to March 2020 as a crisis period, even though still the crisis has not

settled. For this, we have taken the remaining 64 daily price observations of each company. This is on the presumption that the available time period is only good enough to observe the short-term impact of COVID-19 on IT stocks.

Table 1: Market capitalization as on June 2020				
S.	Company Name	Market		
No		Cap (Rs		
		Cr.)		
1	Tata Consultancy Services	6,82,408.68		
	Limited			
2	Infosys Limited	3,98,189.56		
3	HCL Limited	1,91,516.91		
4	Wipro Limited	1,55,405.25		
5	Tech Mahindra Limited	72,625.17		
6	Larsen & Toubro Infotech	43,932.81		
	Limited			
7	Naukri (Info edge India	42,347.25		
	Limited)			
8	MphasiS Limited	21,726.32		
9	Mindtree Limited	19,506.46		
10	NIIT Tech	12,085.43		

Source: Money control

4. DATA ANALYSIS

The daily return data of Nifty as well as IT stocks, were computed by using formula

$$Ri = \left(\frac{P1}{P0}\right) - 1$$

In the above equation, P1 denotes the price of the present day, and P0 stands for the previous day's price. Ri stands for the return of individual stocks.

Table 2: Returns of IT stocks during COVID- 19 crisis				
Stock	Prior to crisis (October 2019 to December 2019)	Crisis Period (January 2020 to March 2020)		
Tata Consultancy Services Limited	0.09%	-0.23%		
Infosys Limited	-0.10%	-0.15%		
HCL Limited	-0.71%	-0.37%		
Wipro Limited	0.09%	-0.31%		
Tech Mahindra Limited	0.14%	-0.40%		

Larsen & Toubro	0.27%	-0.26%	
Infotech Limited			
Naukri (Info edge	0.37%	-0.28%	
India Limited)			
MphasiS Limited	-0.01%	-0.47%	
Mindtree Limited	0.18%	0.14%	
NIIT Tech	0.29%	-0.32%	
NIFTY	0.12%	-0.50%	
Source: Computed Daily Return			
from NSE data			

Table 2 shows the daily returns of various IT stocks prior to the COVID 19 crisis as well as during the period of crisis. The short-term return trend of IT stocks prior to the COVID 19 crisis was promising. Only HCL, Infosys, and MphasiS have reported three-month negative returns of 0.71%, 0.10%, and 0.01% respectively prior to the crisis period. All other stocks were reported to have a positive return during the study period. However, during the period of the Covid-19 crisis, more companies entered into the negative return trend. They are Wipro Ltd, TCS Ltd, NIIT Technology, Larsen & Toubro Infotech Ltd, Tech Mahindra Ltd, Info Edge India Ltd, and Nifty with negative returns of 0.31 percent, 0.23 percent, 0.32 percent, 0.26%, 0.40%, 0.28%, and 0.50% respectively. However, only Mindtree Ltd has a positive return during the crisis period also of 0.14

"The beta of investment security (i.e. a stock) is a measurement of its volatility of returns relative to the entire market. It is used as a measure of risk and is an integral part of the Capital Asset Pricing Model (CAPM). A company with a higher beta has greater risk and also greater expected returns.

The beta coefficient can be interpreted as follows:

- β =1 exactly as volatile as the market
- β >1 more volatile than the market
- β <1>0 less volatile than the market
- β =0 uncorrelated to the market
- β <0 negatively correlated to the market."(Beta, 2020)

Table 3 gives a better representation of the beta coefficient of the IT stocks returns with Nifty return.

$$\beta = \{(n\sum xy) - (\sum x. \sum y)\}/\{n\sum x - (\sum x)\}$$

In the above equation, 'n' stands for a number of observations, 'x' denotes independent returns

(Nifty) and 'y' denotes the return of dependent variables (return of IT stocks).

Here ' β ' indicates the regression results of IT stocks returns with the return of the benchmarking index (Nifty). From Table 3, it is clear that the

Table 3: Regression Analysis Result of IT						
stocks with NIFTY						
Stock	Prior to		Crisis			
	(October		Period			
	2019 to		(January			
	December		2020 to			
	2019)		March			
			2020)			
	Beta	p-	Beta	p-		
		val		valu		
		ue*		e*		
Tata Consultancy	0.56	0.1	0.7	0.00		
Services Limited		1				
Infosys Limited	0.013	0.0	0.92	0.00		
		2				
HCL Limited	0.01	0.4	0.72	0.00		
		5				
Wipro Limited	0.50	0.0	0.68	0.00		
		3				
Tech Mahindra	0.97	0.0	0.94	0.00		
Limited		0				
Larsen & Toubro	0.45	0.2	0.94	0.00		
Infotech Limited		9				
Naukri (Info edge	-0.06	0.8	0.73	0.00		
India Limited)		6				
MphasiS Limited	0.61	0.1	0.68	0.00		
		1				
Mindtree Limited	0.50	0.0	0.93	0.00		
		8				
NIIT Tech	1.09	0.0	1.64	0.00		
		1				
	l	L	l	l		

In the next step, we have calculated the abnormal gain earned by individual stocks over the benchmarking index.

Source: Data analysis* Level of Significance 10%

Beta is calculated using the formula

Covariance of daily return of individual stocks as

Variance of Nifty

Abnormal return is calculated using the formula $\alpha i = Ri - (\beta * Rm)$

Here ' α i' stands for the abnormal return over a market index, 'Ri' denotes individual stock return and 'Rm' represents the benchmarking index nifty return (returns, 2016) .

Those IT stocks which offered an abnormal gain over Nifty prior to the crisis period were considered as winner stocks while the stocks that offered an abnormal loss over Nifty prior to the crisis period were categorized as loser stocks (Table 4). From Table 4 it can be observed that companies like Wipro, TCS, Infosys, NIIT Tech, Mindtree, Larsen & Toubro, Tech Mahindra, Naukri, and MphasiS reported having a positive abnormal return over the market index. Therefore, these stocks can be classified as winner stocks prior to the crisis period and HCL limited is categorized as loser stocks.

Table 4: Return Trend and Direction of						
Movement						
Stock		to crisis	Crisis	Period		
	(Octob	er 2019	(January 2020			
		December	to Mar	rch 2020)		
	2019)					
	Stoc	Abnorm	Stoc	Abnorm		
	k	al	k	al		
	retur	return	retur	return		
	n	index	n	index		
		(%)		(%)		
Tata	0.09	0.37	-	-0.23		
Consultancy	%		0.23			
Services			%			
Limited		0.70		0.45		
Infosys	-	0.53	- 0.15	-0.15		
Limited	0.10		0.15			
TIOT I ! !	%	0.16	%	0.07		
HCL Limited	- 0.71	-0.16	- 0.27	-0.37		
	0.71		0.37			
XV :	%	0.02	%	0.02		
Wipro Limited	0.09 %	0.03	0.31	0.03		
Limited	%0		%			
Tech	0.14	0.62	70	-0.40		
Mahindra	%	0.02	0.40	-0.40		
Limited	70		%			
Larsen &	0.27	0.49	-	-0.26		
Toubro	%	0.77	0.26	-0.20		
Infotech	/0		%			
nd_inifited			70			
Naukri (Info	0.37	0.34	_	-0.28		
edge India	%	0.0 .	0.28	0.20		
Limited)	'-		%			
MphasiS	_	0.29	-	-0.47		
Limited	0.01		0.47	- · ·		
-	%		%			
Mindtree	0.18	0.43	0.14	0.14		

Limited	%		%	
NIIT Tech	0.29	0.83	-	-0.32
	%		0.32	
			%	
Source: Computed				
Daily Return from				
NSE data				

The general assumption is that, it is not necessary that the past trend will repeat in the future also. If so, contrarian strategies are considered to be ideal. During the crisis period, the stocks which were winner stocks prior to the crisis period, were reported to have a negative abnormal return over the market index. The stocks are TCS, HCL, Infosys, NIIT Tech, Larsen & Toubro Infotech, Tech Mahindra, Naukri, and MphasiS ltd. We can easily infer that the investors considered an investment in these loser stocks during the crisis as risky and they have diverted their investment to alternative stocks. Interestingly, Wipro limited and Mindtree Limited has reported a return of 0.03 percent and 0.14 percent in comparison with the market index at the time of the crisis period. We can easily infer that the brand name and the investor's trust and strong supply management has really saved the stock return of the above companies during the crisis period.

HCL Limited seem to maintain the same momentum during the crisis period also. No loser stock prior to the crisis period has become a winner stock during the crisis period. To generalize the results, we have used the criteria suggested by Forner and Madhuenda (2003). During the crisis period, if the difference between the average abnormal returns of the winner stocks and loser stocks is a positive figure, it signals the presence of momentum effect. This can be mathematically expressed as,

$$W[Rit - (t * Rmt)] - L[Rtp - (t * Rmt)] > 0$$
 signals the month of March that there can be an effect on the Indian Information Technology enterprise for $W[Rit - (t * Rmt)] - L[Rtp - (t * Rmt)] < 0$ signals contrariant of feet the scare of the motion of the scare of the scare

In our study, the average abnormal return over winner stocks is 0.085% and that of loser stocks is -2.48%. Here the difference is a positive figure. Thereby we can infer that the IT stocks are moving along with the benchmarking index nifty during the crisis period and the Covid-19 effect has negatively affected the stocks of leading IT companies.

5. CONCLUSIONS

This study signifies that the IT stocks are maintaining a general momentum with the benchmarking index Nifty. However, there is a general perception that during an outbreak of the crisis and especially where there is a lockdown along with the following work from home and social distancing, the demand for IT stocks should increase, because of the increase in demand for network connectivity and more of online work. The general hypothesis of this study is that the market will react positively to favorable news. With respect to Covid-19, this general perception didn't work so far. Since the country's greater than 50 percent of electronic items were imported from China, those have now slid right all the way down to much less than 50 percent because of the pandemic and the lockdown. Over the past couple of decades, the Information Technology enterprise has been India's main quarter to financial growth. It contributes an essential function in satisfying the country's numerous middle-class desires of aspirational careers. However, because COVID-19 outbreak, gamers in India's offerings noticed a big slowdown in growth throughout the economic year. Some reviews declare that pinnacle software program exporters, such as Tata Consultancy Services, Infosys, and HCL Technologies, are impacted the maximum via way of means of the lessened generation spending from customers in the USA and Europe after lockdowns throughout the globe. Customers additionally decreased their IT budgets and bogged down new projects because of the concern of unsure monetary situation and recession.

In a statement, former Chief Financial Officer at Infosys Ltd V Balakrishnan advised with inside W[Rit - (t * Rmt)] - L[Rtp - (t * Rmt)] > 0 signals the month of March that there can be an effect on the Indian Information Technology enterprise for on the motion of humans following the scare, Indian IT corporations 'capacity to supply offerings on web websites online ought to get critically impacted however that ought to be addressed to a degree via way of means of running remotely. In the latest instances, Indian firms have confronted numerous tasks cancellations customers throughout sectors because of obstacles in air tour and closing down of towns and nations

to contain the unfold of the Covid-19 pandemic. In this context, we propose backward integration and funding in R&D activities could assist the Indian IT corporations to maintain in the lengthy run. It is likewise discovered that corporations with robust emblem recognition are maintaining in the disaster duration no matter the general falling marketplace trend.

6. FUTURE FINDINGS

This research has been conducted for just 10 sample stocks, which can be further increased in number to a larger sample size, which can provide and correct picture and more accurate information the entire Information about Technology sector as a whole. F-circuit for all the stocks can be calculated and examined on that basis too about the price movement. Momentum and contrarian strategies can be used to different sectors in the long as well as in the short run and analysis can be done about them.

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