Impact of Covid-19 on sectoral stock prices: An event study based on US stock market

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Impact of COVID-19 on Sectoral Stock Prices: An Event Study Based on US Stock Market

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Abstract The impact of COVID-19 on stock prices of different United States economic sectors is examined using event study methodology. Results revealed that the first confirmed case in US on January 21, 2020 was underestimated by investors and did not disturb stock prices significantly. However, the first local transmission case on February 26, 2020 hit the stock market in the post event window. Due to this event, the stock prices of industries in energy, financials, industrials, real estate and utilities sectors declined but observed price increases in health care, information technology and telecom services industries. First stay at home order issued by California State in USA on March 19, 2020, a form of lockdown which restricted public gathering, reduced the market value of consumer staples, health care, industrials, real estate and utilities sectors. This order brought positive changes in stock prices of energy, consumer discretionary, financials, information technology and telecom services sectors. Results of the study can help portfolio managers and investors in the process of asset selection and risk minimization during these types of pandemics. On the other hand, these findings can assist policy makers in designing strategies in advance for financial stability as well as minimizing the negative consequences resulting from COVID-19 related potential health crises in future

Keywords COVID-19, Stock Prices, Economic Sectors, Event Study

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1 Introduction

Coronavirus (COVID-19) emerged from Wuhan China and was first reported by WHO on 31stDecember, 2019. This virus rapidly spread throughout the world. Lockdowns, closure of educational institutions, curfews in cities, ban on imports and exports, closure of countrys borders, cancellation of flights and postponed international special events (i.e. Olympic Games) all over the world have never been experienced by human beings during the last century (Öztürk et al 2020). This pandemic causes danger not only to public health but economies of the whole world are facing challenges due to this deadly outbreak. As a result WHO declared it as pandemic on March 11, 2020. During April 2020, due to fall in consumer spending, production and closure of business units etc., IMF predicted 3% fall in World GDP in Global Economic Outlook report and World Trade Organization also expected 32% fall in international trade (He et al 2020). These are the clear signs of global recession. This economic downturn created by the pandemic also surpasses past extreme disasters and events. Now it becomes important to understand the economic unrest created by the pandemic outbreak. Therefore, the objective of the article is to examine the impact of COVID-19 on stock prices.

The traditional financial and economic theories explain that market prices of stock mainly depend on firm specific factors and market elements. Firms in the same industries have almost similar policies, regulations and macroeconomic environments. But apart from this effect behavioural finance theories holds that emergencies i.e. COVID-19 and risk elements influence the behavior and psychology of investors which ultimately impact on market prices (He et al 2020). This deadly virus impacts on the economic conditions and investors' state of mind which ultimately influence stock prices.

Most of researcher studied the impact of coronavirus on economic sectors of different countries using first confirmed case date, WHO pandemic declaration date but in this study the first confirmed case (21st January), first local transmission case (26 February) and first order of stay at home issued by California State (19 March) in the United States are considered important announcements related to COVID-19 and expected to have great impact on stock prices. Therefore, it is the need of time to study the impact of covid on different US economic sectors.

Event study methodology is used to measure this phenomena because this is the best technique to observe the impact of an event on the stock market.Therefore,this study uses an event study method to examine the impact of COVID-19 on stock prices of different sectors in the United States.Overall it was found that this pandemic negatively impacted thematerials, industrials, real estate and utilities sectors but created opportunities of growth for information technology and telecom services sectors.

2 Literature review

In the financial market, emergenciesinfluence the behavior and psychology of investors which ultimately impact on stock prices. Event study methodology provided byFama et al (1969) explained whether any specific event has an impact on market price of securities. This method is used widely in diverted fields of life i.e. economics, finance, accounting etc. Normally, emergencies in the shape of terrorist attack, political unrest, financial crisis and natural disasters have observed relationships with stock prices. Drakos (2004) explained the association of stock prices of the airline industry and the events of 9/11. Schneider and Troeger (2006) studied the impact of war and international conflicts on the stock market and world economy. Al-Rjoub (2009) explored whether crises of Mexicos Tequila 1994, crises of Asian/Russian 1997-1998, incident of 9/11, war in Iraq 2004 and financial crisis in 2005 and 2008 have any effect on stock prices.

prices. Pastor and Veronesi (2012) find out that uncertainty in government policies has a negative impact on stock prices. On average stock prices fall when a government announcement is made regarding change in policy. Similarly, by using event study tools Hillier and Loncan (2019) proved that political instability also became the cause of downturn in stock market and especially politically connected firms suffer more. Natural disasters also have remarkable effects on financial markets. Lu et al (2021) observed the drastic negative impact of the 2011 Japanese earthquake on six major stock markets of the world. Robinson and Bangwayo-Skeete (2016) found that tropical storms and hurricanes generate stock market losses in the stock market in the Caribbean. Many researchers studied how emergencies impact different industries. Wang and Kutan (2013) explore the effects of natural disasters on the insurance sector whereas Brei et al (2019) focused on the banking sector.

The existing literature is enriched with studies analysed the impact of emergencies on stock prices but how public health emergencies are impacting stock markets is limited. Past studies relating to health emergencies especially focus on Influenza and SARS disease. McTier et al (2013) confirmed that as influenza cases increase in the US it leads to decline in stock returns and trading activities in the country. Chen et al (2007) analysed the impact of SARS on major stock markets of Asia and China and concluded that it has a considerable negative impact on stock markets. These researchers also found a negative impact of SARS on Taiwan's hotel industry. By studying the literature, it is clear that there is no comprehensive study which explains the impact of emergencies on the entire industrys stock prices.

Current emerging COVID-19 pandemic impacts the global economy and a lot of researchers found the impact of this pandemic on stock markets of different countries. Topcu and Gulal (2020)proved that the negative impact of COVID-19on emerging economies of Asia was more prominent than in Europe. Rajamohan et al (2020) examined the automobile sector of India and found that the pandemic outbreak caused disturbance in manufacturing operations of this sector due to fall in stock prices.Öztürk et al (2020) explored thatTurkish economic sectors responded more strongly to the number of COVID-19 cases in Turkey than coronavirus cases reported in Europe and around the globe. More-

over, they noted the more adverse impact of pandemic on the machinery, metal products, insurance, banking and sports sectors. However,retail and wholesale trade, real estate investment and food-beverage sectors are less affected from this pandemic outbreak.

Furthermore, citegoker2020impact analysed the effect of pandemic declaration on the stock returns of 26 sectors listed on the Borsa Istanbul Stock Exchange using the event study approach.It was noted that due to the pandemic outbreak transportation, tourism, sports and textile industries suffered more from disease outbreak but positive impact was observed on chemistry, banking and food sectors. In the same line, Lu et al (2021) examined that covid outbreak negatively impact the retail and wholesale trade, hospitality and manufacturing sector working under the umbrella of SME in china. In order to explore the negative consequences of COVID-19 on Indian economic sectors, Sidhu et al (2020) studied the Indian stock market. They found thathotels, oil, real estate, entertainment, advertising, construction, travel and transport sectors were worst affected from this deadly disease.

Similarly,Song et al (2021) analysed the response of the US restaurant sector towards COVID-19. Sun (2020) concluded that market prices of different sectors in the US are not affected with the same magnitude due to the pandemic and found that stock prices of different sectors decreased with different rates. Thorbecke (2020) investigated the impact of coronavirus on the stock prices of different sectors of the United States by using the macroeconomic and sector specific variables.Goodell and Huynh (2020) studied the impact of legislators trading in anticipation of pandemic and also explored the reaction of their trading on US industries. They observed that legislators trading in advance affected the financial market and abnormal returns were noted in 15 sectors, more specifically positive returns were identified in pharmaceutical and medical industries while negative returns were revealed in hotels, motels, restaurants, utilities and service industries.Matos et al (2021) identified that the energy sector of the US has a higher value of volatility and losses due to pandemics. Chowdhury and Abedin (2020) studied the impact of the first confirmed case on the US stock market by using the event study methodology.

In this study, the first confirmed case (21st January), first local transmission case (26th February) and first order of stay at home issued by California State (19th March) in the United States are considered important announcements related to COVID-19 and expected to have great impact on stock prices. The effect of these events on stock prices is not explained in literature. Therefore this research will fill the gap in literature by finding the impact of COVID-19 on stock prices of different sectors in the United States.

Event Study is used to examine the behavior of stock prices after an event occurs. This method helps to check the effect of different social, economic and political events on stock prices (Basdas and Oran (2014)). This can also be used to check the market efficiency (Eckbo 2008). Event study is used because the objective of the study is to examine the impact of COVID-19 outbreak on stock prices. There are different models used for calculation of abnormal returns. Market model is widely used because it has excellent predictive power (Brenner 1979).

N. Nadeem, G.M. Kiyani and I.A.Jadoon

Market model is used for calculation of following returns:
Normal return:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} \tag{1}$$

$R_{i,t}$ = Daily return of stock i at trading day t. α_i and β_i are regression coefficients. $R_{m,t}$ is the return of benchmark market.

Abnormal rate of return:

$$AR_{i,t} = R_{i,t} - (\alpha + \beta_{m,t})) \tag{2}$$

Cumulative abnormal Rate of return:

$$CAR_i(t_1, t_2) = \sum_{t2}^{t=t1} AR_{i,t} \tag{3}$$

First confirmed COVID-19 case in the USA was reported on January 21, 2020. And the first local transmission case was registered on 26thFebruary. In order to avoid the impact of disease, the first order of stay at home was issued by California State on March 19, 2020. These three dates are considered important to check the impact of pandemic on the financial market because these events create unrest in the country which ultimately influences economic activities in the country. Short estimation periods cause biased results and long duration results in change in forecast structure. So by considering these issues, 160 trading days before the event period are considered as Estimation windows. Anticipation period in the event window ranges from 5 to 10 days before event day and adjustment period included 10 days after event day. Figure 1 shows the Event Study framework.

S&P 500 composite is considered as a Market index as well as 11 sectoral indices of S&P 500 are used for analysis. Details of industries in each sector is explained in appendix 1. Daily prices of stocks from 18thJune 2019 to 1stMay 2020 are used for analysis which are retrieved form investing.com website. T-test is used for measuring abnormal return during the event window.
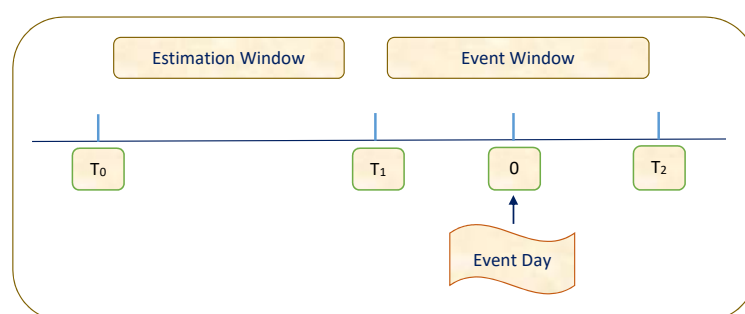

Fig. 1: Estimation window covers 160 trading days, 5 to 10 days before event day is considered as anticipation period and 10 days after event day as adjustment period.

3 Data and analysis

3.1 COIVD-19 First Confirmed Case and Reaction of Sectors Prices

The Centers for Disease Control and Prevention (CDC) confirmed the first COVID-19 case on 21st January in a resident of Washington State US who returned from Wuhan China on 15th January. At that time indication of transmission of virus from one person to another was increasing but how easily corona virus is spreading among persons was not clear (CDC 2020) and no precautionary measures were taken like lockdowns, social distances, travel ban, avoidance from public gathering, shut down of manufacturing operations etc. except CDC only starts entry screening at major airports of US on 20th January. Routine activities in the country were continued without any disturbance and as a result stock market was not disturbed from this first COVID-19 case. It can be seen from Table 1 and 2, only Industrial sector stock prices declined on 21st January because CDC orders to start entry screening at 3 major airports of US 20 January but rebounded afterwards in the event window. However, stock prices of the energy, health care and telecom sector negatively affected after some days of the event. Consumer discretionary, information technology and utilities sector prices rise due to outbreak within the event window.

Table 1: First confirmed COVID-19 Case and Reaction of different US Sectors

	Event widow	Consumer Staples	Energy	Consumer disc	Financials	Health Care	IT
CAR	(-10, 0)	0.762	-4.411	-1.113	-2.255	0.453	0.949
T-Stat	(-10, 0)	0.454	-1.495	-0.976	-1.553	0.323	0.761
CAR	(-8, 0)	1.305	-5.094	-1.345	-1.445	0.224	0.922
T-Stat	(-8, 0)	0.869	-1.931	-1.317	-1.113	0.179	0.826
CAR	(-6, 0)	0.796	-3.030	-0.934	-1.484	0.119	0.352
T-Stat	(-6, 0)	0.612	-1.326	-1.057	-1.319	0.109	0.365
CAR	(-4, 0)	0.489	-2.212	-0.354	-0.975	0.828	-0.199
CAR	(-4, 0)	0.461	-1.186	-0.491	-1.061	0.934	-0.252
CAR	(-2, 0)	-0.150	-1.695	-0.011	-0.142	-0.480	0.430
T-Stat	(-2, 0)	-0.200	-1.285	-0.022	-0.219	-0.766	0.770
CAR	(0, 0)	0.489	-1.496	0.135	-0.575	0.231	0.243
T-Stat	(0, 0)	0.921	-1.603	0.375	-1.252	0.521	0.615
CAR	(0, +2)	-0.259	-1.221	-0.065	-0.129	-0.553	0.604
T-Stat	(0, +2)	-0.345	-0.925	-0.128	-0.199	-0.882	1.083
CAR	(0, +4)	0.191	-2.232	-0.313	-0.318	-1.009	1.037
T-Stat	(0, +4)	0.180	-1.196	-0.433	-0.346	-1.138	1.315
CAR	(0, +6)	-0.750	-3.706	-0.265	-0.358	-1.625	1.844*
T-Stat	(0, +6)	-0.577	-1.622	-0.300	-0.319	-1.497	1.909
CAR	(0, +8)	-0.414	-6.254**	1.933*	0.261	-2.946**	2.221**
T-Stat	(0, +8)	-0.276	-2.371	1.894	0.201	-2.351	1.991
CAR	(0, +10)	-0.631	-4.970*	1.565	0.388	-1.497	1.871
T-Stat	(0, +10)	-0.376	-1.685	1.371	0.267	-1.068	1.500

Note: Estimated Window 160 days
event widow 10 days before and 10 days after
Cumulative Abnormal Returns are first listed and afterwards, t-stat are shown. ***, **, * are significant results at 1%, 5% and 10% confidence level.

Table 2: First confirmed COVID-19 Case and Reaction of different US Sectors

	Event widow	Indus trial	Mater ials	Real Estate	Tele com	Utili ties
CAR	(-10, 0)	-1.135	-0.167	1.571	1.450	3.374
T-Stat	(-10, 0)	-0.784	-0.086	0.646	0.964	1.557
CAR	(-8, 0)	-0.944	0.536	2.725	0.320	3.425
T-Stat	(-8, 0)	-0.729	0.311	1.252	0.238	1.767
CAR	(-6, 0)	-0.423	0.769	2.702	0.556	3.280
T-Stat	(-6, 0)	-0.377	0.515	1.434	0.477	1.954
CAR	(-4, 0)	-0.192	0.193	0.690	0.339	2.566
CAR	(-4, 0)	-0.209	0.159	0.449	0.356	1.872
CAR	(-2, 0)	-0.275	-0.055	0.437	0.312	0.974
T-Stat	(-2, 0)	-0.424	-0.064	0.402	0.464	1.005
CAR	(0, 0)	-0.781*	-0.804	1.167	0.242	0.864
T-Stat	(0, 0)	-1.706	-1.321	1.517	0.509	1.261
CAR	(0, +2)	0.430	-0.638	0.108	-0.406	1.096
T-Stat	(0, +2)	0.664	-0.740	0.099	-0.604	1.130
CAR	(0, +4)	0.794	-1.083	0.412	-0.535	1.672
T-Stat	(0, +4)	0.867	-0.889	0.268	-0.563	1.220
CAR	(0, +6)	1.024	-0.573	-0.285	-0.718	2.028
T-Stat	(0, +6)	0.912	-0.384	-0.151	-0.616	1.208
CAR	(0, +8)	-0.379	-0.510	-0.985	-0.710	2.866
T-Stat	(0, +8)	-0.292	-0.296	-0.453	-0.528	1.479
CAR	(0, +10)	0.334	0.670	-0.900	-2.669	1.508
T-Stat	(0, +10)	0.231	0.348	-0.370	-1.775	0.696

Note: Estimated Window 160 days

event widow 10 days before and 10 days after

Cumulative Abnormal Returns are first listed and afterwards, t-stat are shown. ***, **, * are significant results at 1%, 5% and 10% confidence level.

3.2 COIVD-19 First Local Transmission Case and Reaction of Sectors Prices

Transmission of virus from person to person was confirmed by CDC on 30th January in a press release (CDC 2020). However on 26th February, the first local transmission case was reported in California State and that patient does not have travel history. At that time covid positive cases reach at 60 (Renton and Woodyatt 2020). As seen in Table 3 and 4, the stock prices of different sectors were not affected on that day except the energy sector.

Due to fear of transmission of the virus, almost all major airlines suspended their flights from China to the US during the event window resulting in major declines in prices of the Industrial sector (Josephs 2020) due to disturbance in airlines operations. Similarly returns in financial, energy, real estate and utilities sectors are also adversely affected due to increase in local transmission cases in the post event window. This decline may be due to the uncertain situation in the financial market created by the health crisis which distorts investors confidence about future returns. After the day of event favourable price changes are observed in the stock prices of industries in health care, information technology, and telecom sector but consumer staples industries prices first declines but later favourably improved. Materials and consumer discretionary sector returns did

not significantly fluctuate.

Table 3: Event 2: 26-02-2020 First Local Transmission Case

	Event widow	Cons staples	Ene rgy	Consumer disc	Finan cials	Health Care
CAR	(-10, 0)	-0.168	0.353	0.832	0.261	-0.531
T-Stat	(-10, 0)	-0.107	0.116	0.651	0.191	-0.367
CAR	(-8, 0)	0.724	-1.506	-0.193	0.679	-0.591
T-Stat	(-8, 0)	0.517	-0.555	-0.169	0.554	-0.456
CAR	(-6, 0)	-0.072	-0.576	0.191	0.653	-0.167
T-Stat	(-6, 0)	-0.060	-0.245	0.193	0.615	-0.149
CAR	(-4, 0)	0.551	-1.224	-0.239	0.986	-0.104
T-Stat	(-4, 0)	0.556	-0.637	-0.295	1.138	-0.114
CAR	(-2, 0)	-0.619	-1.724	-0.007	0.468	-0.746
T-Stat	(-2, 0)	-0.885	-1.270	-0.012	0.764	-1.152
CAR	(0, 0)	-0.285	-2.377**	-0.309	-0.243	0.223
T-Stat	(0, 0)	-0.575	-2.476	-0.765	-0.561	0.487
CAR	(0, +2)	-3.185***	1.878	0.203	-1.068*	-0.248
T-Stat	(0, +2)	-4.549	1.383	0.356	-1.743	-0.383
CAR	(0, +4)	-0.062	0.095	-0.281	-1.917**	0.501
T-Stat	(0, +4)	-0.062	0.050	-0.348	-2.211	0.548
CAR	(0, +6)	2.371*	-1.855	-1.372	-4.418***	3.213***
T-Stat	(0, +6)	1.956	-0.789	-1.386	-4.161	2.866
CAR	(0, +8)	2.476*	-16.990***	-0.060	-8.206***	5.478***
T-Stat	(0, +8)	1.768	-6.256	-0.052	-6.694	4.231
CAR	(0, +10)	0.449	-17.162***	-0.041	-7.729***	4.996***
T-Stat	(0, +10)	0.287	-5.652	-0.032	-5.639	3.451

Note: Estimated Window 160 days
event widow 10 days before and 10 days after
Cumulative Abnormal Returns are first listed and afterwards, t-stat are shown. ***, **, * are significant results at 1%, 5% and 10% confidence level.

3.3 First Order of Stay at Home and Reaction of US Sectors Prices

CDC proposed the cancellation of all events in which 50 or more persons are involved in the whole country on 15th March (Kopecki 2020). So, in order to save the public from this deadly disease, California State issued the first order of Stay at home on 19th March. Results in Table 5 and 6 proved that stay at home orders negatively affect the stock prices of industries in consumer staples, industrials, health care, real estate and utilities sectors. But rises in the stock prices of energy, consumer discretionary, financials, materials and telecom services sectors are recorded.

Real estate sector is seriously hit by this event and its prices fall continuously because this was the start of restrictions on construction activities. Whereas, information technology and telecom services industries stock prices increase during the event window. This favourable increase in market price of these sectors

N. Nadeem, G.M. Kiyani and I.A.Jadoon

Table 4: Event 2: 26-02-2020 First Local Transmission Case

	Event widow	IT	Indu strial	Mat erials	Real Estate	Tele com	Utili ties
CAR	(-10, 0)	-0.519	-0.167	0.309	2.528	0.445	-0.104
T-Stat	(-10, 0)	-0.428	-0.116	0.177	1.082	0.323	-0.052
CAR	(-8, 0)	-0.047	-0.627	-0.042	1.018	0.985	-0.172
T-Stat	(-8, 0)	-0.043	-0.487	-0.027	0.487	0.798	-0.096
CAR	(-6, 0)	-0.104	0.091	0.202	-0.565	0.776	-1.725
T-Stat	(-6, 0)	-0.111	0.081	0.150	-0.312	0.726	-1.110
CAR	(-4, 0)	-0.496	0.838	0.304	1.048	0.206	-1.259
T-Stat	(-4, 0)	-0.647	0.920	0.276	0.710	0.236	-0.992
CAR	(-2, 0)	0.975*	-0.142	-0.911	-1.101	0.764	-1.678
T-Stat	(-2, 0)	1.798	-0.221	-1.168	-1.055	1.237	-1.870
CAR	(0, 0)	0.844	-0.362	0.073	-0.719	0.170	-0.916
T-Stat	(0, 0)	2.202	-0.795	0.132	-0.973	0.390	-1.443
CAR	(0, +2)	2.293**	0.680	-0.712	-5.818***	1.498**	-6.678***
T-Stat	(0, +2)	4.228	1.055	-0.913	-5.571	2.428	-7.442
CAR	(0, +4)	1.717**	-0.853	1.050	-1.681	-0.084	-2.583
T-Stat	(0, +4)	2.240	-0.936	0.952	-1.138	-0.096	-2.035
CAR	(0, +6)	1.584*	-2.447**	1.143	-0.436	-1.060	1.141
T-Stat	(0, +6)	1.687	-2.193	0.847	-0.241	-0.992	0.734
CAR	(0, +8)	4.210***	-2.565**	-1.678	-5.172**	0.948	-2.817
T-Stat	(0, +8)	3.883	-1.991	-1.076	-2.476	0.768	-1.570
CAR	(0, +10)	5.924***	-3.290***	-2.459	-5.665**	1.083	-7.027***
T-Stat	(0, +10)	4.886	-2.284	-1.411	-2.426	0.784	-3.502

Note: Estimated Window 160 days
event widow 10 days before and 10 days after
Cumulative Abnormal Returns are first listed and afterwards, t-stat are shown. ***, **, * are significant results at 1%, 5% and 10% confidence level.

was due to increase in demand for these services for completion of assignments at home. It is also surprising that companies in consumer staples, health care and utilities sectors earned positive abnormal returns before this event but this event adversely impacted on their market price. Due to the lockdown, the unemployment level increases not only in the US but throughout the world which decreases the income as well as purchasing power of households. As a result, decrease in purchasing power lead towards fall in demand for consumable goods, utilities and health care services. However, industries in energy, consumer discretionary, materials sectors were facing a negative trend in prices before this order but after that their stock prices rose continuously. We can conclude that traditional industries are more affected from COVID-19 but it creates growth opportunities for high tech industries.

4 Conclusion

The study examined the impact of COVID-19 on stock prices of different sectors in the United States at different coronavirus related announcements using event study methodology. Investors act differently at the happening of certain events and adjust their portfolios by shifting their funds from one sector to another. Reporting of first confirmed case (Event 1) underestimated by investors and did not

Table 5: Event 3 19-03-2020 First Order of "Stay at Home"

	event widow	Cons staples	Energy	Consumer disc	Financials	Health Care
CAR	(-5, 0)	5.909***	-17.747***	-6.086***	-2.202**	2.886***
T-Stat	(-5, 0)	4.674	-7.942	-6.641	-2.175	2.733
CAR	(-4, 0)	8.091***	-15.572***	-5.009***	-1.676*	1.455
T-Stat	(-4, 0)	7.154	-7.791	-6.112	-1.851	1.540
CAR	(-3, 0)	6.596***	-14.929***	-2.664***	-4.972***	3.196***
T-Stat	(-3, 0)	6.735	-8.625	-3.753	-6.340	3.907
CAR	(-2, 0)	4.697***	-14.002***	-1.556***	-3.881***	2.039***
T-Stat	(-2, 0)	5.874	-9.907	-2.684	-6.061	3.053
CAR	(-1, 0)	0.772	-8.675***	-0.157	-3.248***	1.408***
T-Stat	(-1, 0)	1.366	-8.680	-0.383	-7.174	2.980
CAR	(0, 0)	-3.271***	6.457***	3.015***	1.782***	-2.336***
T-Stat	(0, 0)	-5.785	6.461	7.358	3.936	-4.946
CAR	(0, +2)	-4.132***	2.291	4.349***	-1.510**	-2.335***
T-Stat	(0, +2)	-5.167	1.621	7.504	-2.358	-3.496
CAR	(0, +4)	-7.321***	12.511***	4.558***	2.660***	-3.372***
T-Stat	(0, +4)	-6.474	6.259	5.560	2.938	-3.570
CAR	(0, +6)	-4.530***	9.232***	2.954***	2.767**	-1.546
T-Stat	(0, +6)	-3.270	3.771	2.942	2.495	-1.336
CAR	(0, +8)	-3.913**	10.477***	1.852	-0.022	1.039
T-Stat	(0, +8)	-2.447	3.707	1.597	-0.017	0.778
CAR	(0, +10)	-1.292	17.539***	0.264	-1.164	1.890
T-Stat	(0, +10)	-0.722	5.550	0.204	-0.813	1.265

Note: Estimated Window 160 days

event widow 05 days before and 10 days after

Cumulative Abnormal Returns are first listed and afterwards, t-stat are shown. ***, **, * are significant results at 1%, 5% and 10% confidence level.

bring any notable change in stock prices. However, the first local transmission case (Event 2) got the attention of investors in the post event period. This news leads to declines in market prices of industries in energy, financials, industrials, real estate and utilities sector but observed rise in stock prices of companies in health care, information technology and telecom services sector after some days of announcement. Meanwhile, it is also noted that market value of companies in the consumer discretionary and materials sector is not disturbed. First stay at home order (Event 3) significantly affected the stock market. This order negatively affects the stock prices of consumer staples, health care, industrials, real estate and utilities sector corporations but brings positive price change in energy, consumer discretionary, financials, information technology, telecom services sector industries. Materials sector companies earn abnormal gains on the day of announcement but afterwards their prices decrease continuously.

Overall it is found that pandemics seriously affected the materials, industrials, real estate and utilities sectors because lock downs, decrease in demand, rise in unemployment level move these sectors towards break even and in some cases, businesses close down their units to avoid total loss. On the other hand, this health crisis creates growth opportunities for the information technology and telecom services sectors which are actually high tech industries. These sectors show growth potential because during the pandemic, office assignments, education and other related activities were shifted to online mode which increased demand in these sectors. However with respect to these three events, mixed re-

Table 6: Event 3 19-03-2020 First Order of "Stay at Home"

	IT	Industrial	Materials	Real Estate	Telecom	Utilities
CAR	4.349***	-5.560***	-2.586**	-9.857***	1.800*	-0.968
T-Stat	4.634	-5.305	-2.038	-5.323	1.791	-0.534
CAR	2.339***	-4.571***	-2.060*	-7.316***	1.711*	3.399**
T-Stat	2.786	-4.877	-1.815	-4.417	1.904	2.095
CAR	2.068***	-3.359***	-0.188	-9.887***	1.300*	3.661***
T-Stat	2.845	-4.138	-0.191	-6.893	1.670	2.606
CAR	1.040*	-3.671***	-0.190	-1.101	0.404	7.845***
T-Stat	1.752	-5.538	-0.237	-0.940	0.635	6.839
CAR	1.837***	-2.046***	-1.188**	-4.118***	2.090***	-1.491*
T-Stat	4.376	-4.365	-2.093	-4.973	4.650	-1.838
CAR	0.455	-0.092	1.811***	-1.676**	1.215***	-5.824***
T-Stat	1.084	-0.196	3.192	-2.023	2.703	-7.181
CAR	3.568***	-2.352***	-1.444*	-6.362***	1.849***	-9.134***
T-Stat	6.012	-3.548	-1.799	-5.432	2.909	-7.963
CAR	0.271	5.471***	2.453**	-0.217	-3.895***	-2.006
T-Stat	0.323	5.837	2.161	-0.131	-4.332	-1.237
CAR	-1.710*	4.822***	0.936	5.601***	-4.660***	4.997**
T-Stat	-1.663	4.201	0.673	2.761	-4.232	2.515
CAR	-1.684	3.430**	1.177	3.886*	-3.257**	3.466
T-Stat	-1.419	2.587	0.733	1.659	-2.562	1.511
CAR	-1.580	2.470*	0.196	0.448	-3.352**	1.688
T-Stat	-1.191	1.667	0.109	0.171	-2.359	0.658

Note: Estimated Window 160 days
event widow 05 days before and 10 days after
Cumulative Abnormal Returns are first listed and afterwards, t-stat are shown. ***, **, * are significant results at 1%, 5% and 10% confidence level.

sults are noted in consumer staples, energy, consumer discretionary, financials and health care sectors and fails to reach at identical points.

Results of the study can help portfolio managers and investors in the process of asset selection and risk minimization during these types of pandemics. Furthermore, these market players should continuously monitor the performance of different sectors and reallocate funds across sectors to avoid losses. On the other hand, these findings can assist policy makers in designing strategies in advance for financial stability as well as minimizing the negative consequences resulting from COVID-19 related potential health crises in future. Concern authorities should announce financial packages as well as supportive policies for sectors which are adversely affected from pandemic in order to save them from total disaster. Similarly, appropriate planning is also required for those sectors whose performance is improved during this deadly disease and provide them technical as well advisory support for further growth.

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