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***“An Event Investigation On Pharma, Banking, And Telecom Sector Stocks:  
Rampant Effect Study”***



**By:**

**Muhammad Rizwan**  
**Syed Zulkifal**  
**Ariyan Alam**

**01-111182-052**  
**01-111182-107**  
**01-111182-017**

**BBA**

**Supervisor:**  
**Professor Dr. Taqadus Bashir**

**Department of Business Studies**  
**Bahria University Islamabad**

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### **Dedication**

This study is dedicated to our parents, who have our source of inspiration and who continually provide moral, spiritual, and emotional support.  
To our supervisor, Dr. Taqadus Bashir, who has been our teacher and mentor, and made us capable of what we are today.

## **Acknowledgement**

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## Abstract

Stock markets are extremely sensitive to macroeconomic, financial, geopolitical, political, and pandemic events. The world recently suffered a severe COVID-19 pandemic that lasted more than two years. Global financial markets and economies have taken a major shock. Stock markets around the world experienced the greater falls during pandemic. But scholarly work showed that certain sector performed better during pandemic than non-pandemic period. This study was carried out to investigate the widespread impact of COVID-19 on the stock returns of Pakistan's banking, pharmaceutical, and telecommunications sectors. The daily closing prices of the KSE-100 Index and the daily share closing prices of 27 firms from three different sectors, banking, pharmaceuticals, and telecommunications, were considered. Prices were taken from one year before the pandemic, from March 1, 2019, to February 28, 2020, known as the Pre-COVID Era, and one year following the outbreak, from March 1, 2020 to February 28, 2021, known as the Post-COVID Era. The impact was determined using regression analysis. The findings compared the returns in both time periods, and it was observed that the stock returns in the post-COVID era were significantly higher than those in the pre-COVID era.

**keywords:** *Stock returns, Financial markets, Coronavirus, Regression, Rampant,*

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# Chapter 1

## Introduction

### 1.1. Background of Study

Financial markets, as the economic indicator, are extremely sensitive to events such as announcements, crises, disasters, environmental events, political instability, and shocks (Younis et al.2020; Hillier and Loncan, 2019). That is why stock markets are equity share marketplaces and selling/buying choices are made extremely fast based on any information. Any news concerning macroeconomic and financial variables such as the current account deficit, economic growth, employment, foreign exchange (FX), inflation, and interest rates could have an impact on stock exchange indexes. In addition to announcements, stock exchanges consider expectations. As a result, any news, developments, or expectations connected to the economy, finance, or politics may have an impact on equity shares and stock exchange indices. (Lobo, 2020)

The world has recently been confronted with a new challenge. However, this difficulty arose from a completely different domain (health), as opposed to other recent challenges such as the 2008 Global Crisis. The world has been dealing with coronavirus (COVID-19) disease since 2019. In 2019, the first case of COVID-19 was discovered in Wuhan, China. Since the first case was identified, it has spread rapidly to every corner of the globe. This virus has been labelled "unusual" due to its wide range of symptoms and rapid spread. Concerns about the spread of the Coronavirus Disease 2019 (COVID-19), as well as government restrictions aimed at reducing person-to-person contact, resulted in a bare economic impact. (2021 CRS Reports)

On January 30, 2020, the World Health Organization (WHO) declared the COVID-19 outbreak a Public Health Emergency of International Concern, and on March 11, 2020, it declared a global pandemic (WHO 2020). To prevent virus spread, the World Health Organization (WHO) urged countries to implement strict social distancing and quarantine measures. Despite WHO's strong measures and country lockdowns, COVID-19 spread all over the world, infecting 544 million and 6.3 million people as of June 2022. (John Hopkins University, 2022).

Governments adopted exceptional precautions to safeguard public health and the economy. Nations offered sizeable financial assistance to businesses that were having financial difficulties, relief packages for the public, reduced the interest rates, and they also temporarily lowered taxes, postponed tax payments without charging interest or penalties, and implemented policies for the industries to sustain the economy during the pandemic (IMF Report, 2021a).

### **1.1.1. Financial markets**

A financial market is similar to any other market in that buyers and sellers can trade financial assets such as bonds, equities, various international currencies, and derivatives. Financial markets connect individuals who have capital to invest with those who need capital. Financial markets enable participants to transfer risk (usually via derivatives), advance trade, and raise capital. Financial markets may provide you with the option to invest money in stocks (also known as equities) to save for the future. Financial markets play an important part in the flow of money in the market. As the 2007 financial crisis shown, markets were brittle during the crisis. This susceptibility had an impact on the whole economy. Banks were less willing and able to lend to consumers and businesses. As a result of the decreasing economic activity, many people lost their jobs. However, it is critical that the financial markets operate in a secure environment. (K. Amadeo, 2022)

### **1.1.2. Stock market and their importance in economy**

A regulated public market where stocks are issued and traded is referred to as a stock market. The performance of a country's stock market is the strongest predictor of how well that country's economy is performing. Stock exchanges include all industries and sectors of the economy. This means they act as a barometer of the economy's cycle as well as the hopes and anxieties of the people who generate growth and prosperity. (Tan H. ,2020)

Fair management of the concept's various trades and exchanges falls to the stock market. This involves ensuring that the idea itself comes true: that there is a place (of sorts) where these transactions can take place in a regulated, safe environment, aided by a common set of standards that enable everyone to be able to access the same alternatives.

Stock markets help companies grow and expand by enabling them to raise capital, which in turn increases productivity and employment across the country. It is crucial to the expansion

and development of a powerful and thriving economy. A brittle economy can become more adaptable and safer. Investments are what drive economic growth and advancement. To encourage investment, which infuses money into the economically productive sectors, the government creates fiscal and monetary policies. The stock market is one of the most well-liked venues for the general people to make investments.

The stock market encourages the mobilization of domestic savings through the issuing of equity shares and the distribution of cash collected to productive areas that require financial resources to run and function in an economy. On the one hand, capital gains and dividend payments benefit investors by encouraging consumer spending, then on the other, enterprises benefit from easy access to public funds that may be utilized to fund operations. This transfer of resources from the surplus unit to the deficit unit will enable businesses to grow their operations, raise money for new initiatives, invest in cutting-edge technology, and generate employment. Both the output rate and the unemployment rate consequently rise. (Maharjan, 2022)

Governments can trade on a platform provided by stock markets. A municipal, state, or federal government may occasionally require more funding to establish a community housing estate, construct a water treatment facility, or launch any other public projects. It can issue bonds through the stock market instead of raising taxes to get the needed money. When investors purchase these bonds, the government can raise the funds required to start a number of projects that can lower living expenses or even generate employment for residents. This strengthens the economy over time (A. Green, 2015). Money provided through the stock market encourages economic growth by increasing investment and expenditure, lowering unemployment, increasing personal income, and raising the standard of living for all individuals. (Fischer, 1984)

### **1.1.3. Stock market reaction to events**

The global economy is interconnected, which can result in a spillover effect, which occurs when a major global event in one area of the world has an impact on many other regions of the world. Events of any kind, whether political, economic, or natural disasters, have an impact on the stock market. A study on the reaction of stock prices to political disturbances discovered that there is a significant tendency for significant price fluctuations to become negative within the first two days after a major political event. Stock market prices tended to

rise on days two through five following the events, indicating that the market may have overreacted. (Niderhoffer,1971)

The stock market is influenced by investor sentiments, which are influenced by external events. The unfavorable price reaction from investors in the aftermath of 9/11 caused the US stock market to lose trillions of dollars. The unanticipated tragedy had global ramifications; also, 94 percent of the world's 33 stock markets saw large negative "abnormal" returns following the incident. "When information of a cataclysmic occurrence gets known, investors frequently exit the market in search of safer financial securities, and panic selling ensues" (Chen and Siems, 2004).

As a result of the 2007-2008 financial crisis, financial markets in many countries around the world collapsed. Real stock prices in the S&P 500 Index have fallen by more than half since their peak in 2007, while GDPs in the other affected countries have roughly reverted to 1990s levels. Japan's GDP, for example, fell by nearly 15% in the first quarter of 2009. (Jones, 2009). Neaime (2012) investigated the impact of the 2008 financial crisis on Middle Eastern and North African stock markets. It was discovered that countries with relatively extensive economic ties to the United States and European nations appeared to be more severely harmed by the crisis. Natural disasters, like "neutral" economic and "negative" political events, generate large spillover effects within fifteen days, according to a study of 60 major world events and their impact on stock prices. (Rosvall, 2014)

#### **1.1.4. Historic evidence of epidemics impact on Global markets and economy**

Contagious diseases are not only one of the leading causes of death throughout history, but they are also a major cause of economic downfall. The recent pandemic demonstrates that infectious diseases spread easily despite strict controls, threatening nations' economic stability. Previous pandemics such as the Black Death, SARS, Influenza, H1N1, Ebola, and Swine Flu had similar economic consequences around the world.

Since 1900 there have been three major pandemics that killed not only millions of people but also devastated economies and major stock markets. The first was the Spanish flu pandemic of 1918, which impacted over one-third of the world's population at the time. Because there was a shortage of workers at the time, urbanization, which had been expanding rapidly, abruptly came to a halt. Due to severe influenza, the per capita income in the United

States dropped from \$1,111 to \$968 during 1917 and 1918. The Spanish flu at that period, according to the Dow Jones industrial average for 1918 and 1919, also coincided with the end of World War One. (Shang, Li, Zhang, 2021)

The Asian flu was the second major pandemic of the 1900s, caused by the H2N2 virus. When it first emerged from East Asia in 1957, it killed millions of people and devastated global economies. In August 1957, the United States started a year-long recession. The Dow Jones industrial average fell 19.4 percent in October 1957, a significant decrease.(zareen, 2020) In the second half of 1957, the Dow Jones Industrial Average lost 15% of its value, and the United States went through a recession. Sickness benefits totaling £10,000,000 were given out by the British government, forcing certain firms and mines to cease. In Ireland, many schools, including seventeen in Dublin, had to close. (National Interest Org, 2020)

Swine flu, the final big pandemic, was caused by the novel H1N1 virus and spread to 72 nations, infecting 60.8 million people (CDC). According to one research, a mild scenario would cost the world economy roughly \$360 billion, while an extreme scenario might cost up to \$4 trillion within a year of the epidemic (J. McKibbin, 2009). It was less devastating than past pandemics, but the preceding pandemic's panic and anxiety caused economies to plummet dramatically. In terms of the financial market impact of the pandemic, investors aggressively purchased pharmaceutical company stocks while selling out of pig and livestock manufacturing industries. Pharmaceutical company stocks closed at a high, as forecast by investors. Overall, the Dow Jones industrial average sank 51.29 points on April 27, 2009, while the broader Standard & Poor's 500-stock index sank 8.72 points and the Nasdaq fell 14.88 points. (N. Godt, 2009)

### **1.1.5. Economic impact of COVID-19**

The global economy was once again in a severe depression, after 2008 collapse. Following the announcement of a pandemic by the World Health Organization (WHO), every country of the world found its economies in the doldrums. The Purchasing Manager Index (PMI) for China was 50.2 in December and November of 2019 before the epidemic (> 50.0 implies growth)<sup>1</sup>. Between January and February, the index fell 14.3 points. It indicates that overall purchasing power of people significantly dropped during the COVID-19. (JP Morgan, 2020)

On March 16, 2020, COVID-19 became a very real issue for market investors. Everyone began to realize that we would be subject to a protracted lockdown that week. Shortly after the market opened, the S&P 500 plummeted 7%, triggering circuit breakers that stopped trade for 15 minutes. After similar halts on March 9 and 12, it was the third circuit breaker halt in a week. The Dow industrials experienced a 12.9 percent decline, the second-largest post-World War II percentage loss (after 1987's 22.6 percent decline). The S&P 500 suffered its third-largest percentage loss after falling by 12 percent. The Nasdaq experienced its biggest percentage loss ever, falling 12.3 percent. (CNBC, 2021)

The impact of the pandemic has been described using market exchange rate weights on the global economic outlook. As a result of the coronavirus epidemic, the world economy shrank by 5.2 % in 2020, making it one of the four worst downturns in 150 years (WSJ 2020). The governments of the globe made tremendous measures to prevent a major recession, but despite their best efforts, it was impossible to restore all the lost supply and trade links, which subsequently had to have a very negative impact on the economy.

Most nations were anticipated to experience a recession by 2020. Advanced economies were expected to shrink by 7%. Because countries were mostly left to handle their own domestic epidemics, it was predicted that emerging markets and developing economies would contract by 2.5%. Per capita incomes are expected to decline by 3.6%, which will tip millions of people into extreme poverty this year. The humanitarian issues, such as food shortages in some areas, severely hurt the larger markets, but the emerging and developing nations were hit the hardest. Along with the enormous issue of food shortages brought on by a disruption in agricultural market supply. There were increasing numbers of issues for the developing nations. Capital flow was subdued as there were large trading losses and remittances fell to all-time lows. (World Bank, 2020)

When travel was banned, another industry that suffered greatly was the tourism sector. Tourism contributes to the economies of various countries; many individuals lost their employment. Export revenues from tourism fell by \$910 billion to \$1.2 trillion in 2020. This had a wider impact on global GDP, and the global GDP was reduced by 1.5% to 2.8% (UNWTO, 2020). Countries enforced stringent lockdowns, ordering everyone to remain indoors, in an effort to limit the pandemic, which ultimately caused a drop in oil demand and a collapse in oil prices (UNC Global, 2020). Before COVID 19, many developing nations

were already dealing with significant issues, and the shock of the epidemic has made it even more challenging to resolve these issues (World Bank, 2020).

The lockdowns have disrupted corporate operations and caused a reduction in output. The lockdowns have also affected supply and demand around the world, with the United States' GDP falling 3.5 % in 2020. It was the largest annual decline since World War II and the first since the Great Depression. Millions of individuals have lost their jobs in the United States, as in every other country. In April 2020, the unemployment rate reached an all-time high of 14.7 %, up from 3.5 % in February. (CRS report, 2021)

In March 2020, the US Treasury market was tense. Severe pressure was also seen in the corporate bond and money markets. The market immediately recovered. The S&P 500 lost a third of its value after the COVID meltdown in February-March 2020. Similarly, the corporate bond yield in the United States surged relative to 10-year Treasury yields in February and March 2020 before soon returning to the previous year's average. The Federal Reserve's initiatives were significantly responsible for the financial markets' revival. The reasons for the instability in the corporate bond market were a lack of liquidity as institutions such as mutual funds requested more and more liquidity. (M. Mazur, M. Dang, M. Vega, 2021)

Figure 1-1 Daily Close of S&P 500 and DOW Jones Industrial average during COVID-19 (source Hifregecon.com)

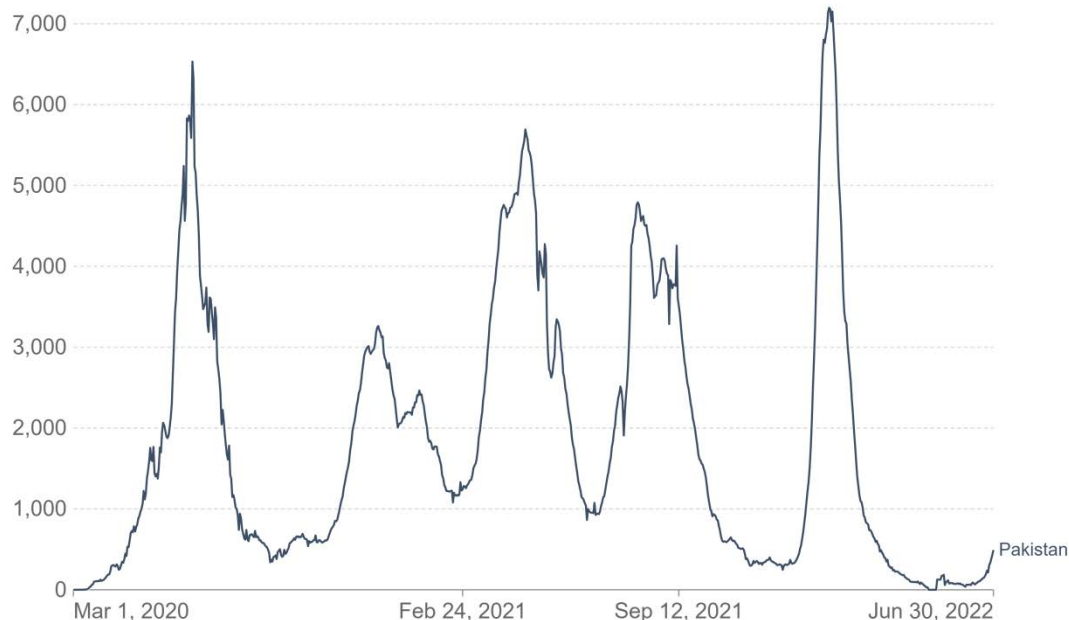


### 1.1.6. Pakistan's stock Market and the impact of COVID-19

The outbreak of COVID 19 came as a real shock to the world. Just like any other country in this world, Pakistan suffered a severe blow to its economy. The first case was discovered in

Karachi, Pakistan on February 26, 2020, (K. Naimat, 2020). As of today, total confirmed cases in Pakistan are more than 1.5 million and 30,000 confirmed deaths due to COVID-19 (John Hopkins, 2022b). Even without the announcement of a pandemic, the forecasts for Pakistan's economy were already poor. In 2020, Pakistan ranked in the top 10 most affected countries with COVID 19 (OCHA, 2020). The financial consequences of this pandemic were massive. In 2019, Pakistan's GDP growth rate was 3.3%, and it was further estimated that COVID 19 for reasons other than increasing poverty. The outbreak of COVID 19 adversely affected the Pakistani economy. To prevent these adverse effects, the government of Pakistan took several measures such as closing educational institutions, suspending international travel and provincial lockdowns. (M. Ziauddin, 2020)

Figure 1-2 Pakistan's daily confirmed cases of COVID-19 (source John Hopkins)



As precautions were taken to stop the virus from spreading, it saw a loss of 4.6 percent in GDP, and with it, unemployment increased considerably as a result of layoffs. From 12.3 million to 18.5 million people were unemployed. Due to the precipitous drop in disposable income, SMEs were once more forced out of business. Pakistan had to look for an Expanded Fund Facility (EFF) program with the International Monetary Fund (IMF) months before the epidemic began in July 2019 due to the issue of its dual deficits, i.e., fiscal account and current account. The nation was able to cut its current account deficit (CAD) by more than 70% in the first seven months of fiscal year (FY) 2019–20 with the help of stringent import restrictions and a significant devaluation. However, this was at the expense of the economy,



which saw a decline in growth from 5.6% in 2018 to 3.3% in 2019. Without taking into account the epidemic, it was predicted to fall even lower to 2.4 percent in 2020. Meanwhile, the fiscal deficit problem remained unchecked - in part because revenue collection was significantly below targets and because the government cut development spending to show a positive primary balance, which was a condition of the IMF program. (A. Pasha, S. Kardar 2019)

Most nations have been pushed by the pandemic to abandon tradition and start extensive reforms in their economies, politics, and foreign and security policies. In order to avoid implementing the changes it had agreed to as a condition of the 2019 IMF bailout, Pakistan used COVID-19 as an opportunity for concessions, bailouts, and debt relief. The nation received \$ 1.5 Billion bailout fund from China to pay back the \$ 2 Billion debt to Saudi Arabia. (Middle East monitor, 2020)

Estimates show that Pakistan's economy suffered a loss of \$1.3 trillion. A third of the country's population was already living below the poverty line and this outbreak resulted in a 40% increase to this number. Exporters from A are facing order cancellations and demand for textiles around the world has plummeted. Pakistan faced a negative spillover effect from the world economy. A spillover of \$44 million came from China into Pakistan's textile sector, resulting in 500,000 layoffs in the sector, which is one of the sectors providing huge employment in the country. (S. Sareen, 2020)

The Pakistani government's Ehsas program distributed 900 million to poor families. Exporters and small industries have also received assistance and the State Bank of Pakistan has reduced the policy rate from 13.25% to 8%. All these measures seemed futile as all sectors of the economy faced massive losses alongside the unprecedented rate of poverty and unemployment. (The News, 2020)

Balance of payments support and exchange rate control from foreign reserves are very important for any country, and this can be achieved through trade and thus trade is the backbone of every economy. With the authorities' decision to shut down industries, the economy began to shrink. The start of a rise in the number of COVID 19 cases led to a decline in the stock market on March 19th. On this day, it hit its lowest level in the past five years. The reason for this huge decline was the withdrawal of foreign investors from their investments in their foreign portfolios. And the closing of industries put more pressure on the

stock market, which led to a downturn in the direction of the stock market. It was at the beginning of the pandemic that it caught him by real surprise and the government was taking any necessary action to prevent the spread of the virus. Later with the \$1.4 billion grants approved by IMF to face the pandemic situation, the financing also came from the World Bank which indirectly helped the stock market to recover, and industries in the country also showed some recovery. With the measures taken by the Government of Pakistan to stem economic losses and financed by IMF and the World Bank, the KSE100 index which was at 39,385 on March 5th showed an upward trend and on March 26th it reached 44,960. (M. Ghumman, 2020)

## **1.2. Objectives of study**

The study provides an insight at how stock prices in Pakistan's banking, pharmaceutical, and telecommunications sectors react to the COVID-19 outbreak. However, there is a pandemic reality that must be included in any economic and financial analysis. Likewise, other factors such as political instability, government policies, and any worldwide event may have an impact on stock exchanges. As a result, other variables are kept in the study.

## **1.3. Research question**

This study answers the following questions:

1. To what extent does the COVID-19 pandemic affect stock market returns?
2. Which sectors' return responded significantly to COVID-19?

## **1.4. Significance of study**

This epidemic has done the more harm to the world's economies than any other (A. McKeever, 2021). Despite medical advances and tight lockdowns during COVID-19, the virus spread like wildfire and devastated everything. It is vital to analyze the economic impact of the epidemic. Several studies have been conducted on this topic, and there is still room for more research. This research is important in a number of ways in this setting. Firstly, it contributes to the expanding body of literatures on COVID-19 and its aftermath. Second, it contributes to the literature on the stock market's reactions to worldwide pandemics. Furthermore, it is analyzing the impact of this pandemic in the context of

Pakistan, which was among the countries hardest hit. Furthermore, this research will help investors prepare for future outbreaks in these sectors.

### **1.5. Scope of study**

The study is carried out to determine the pandemic impact on stock values across several sectors in Pakistan. A total of 27 listed companies from the banking, pharmaceutical, and telecommunications sectors are selected. The dependent variable, the daily closing prices, are collected one year prior to the COVID-19 pandemic and one year following the pandemic. Additionally, for respective timeline, the daily closing prices of the KSE-100 Index (an independent variable) are recorded. The "Regression Model" function in Microsoft Excel is used to examine the relationship between the two variables.

### **1.6. Problem statement**

Scholarly work has been produced during the pandemic to study the impact of COVID-19 on the stock market, in particular identifying elements of global crisis, market reactions, return on indices, as well as pre- and post-COVID-19 analysis. In Pakistan, extensive research work has been done to study the pandemic's impact on stocks, but no particular sector has been identified, and no pre- and post-COVID-19 analysis has been done to show the relationship between the pandemic and return on stock indices. Although many studies have shown a negative market reaction to the pandemic, we have seen that global lockdowns (preventive measures) and a continuous health threat have let three sectors get more business than any other. These three sectors include Pharmaceuticals, Banking, and telecommunications. Because of the health threats we saw shortages on the supply-side because of the demand spike, money circulated more than ever, borrowings increased for businesses and individuals alike and so did the use of electronic media. This event study aims to find out the pandemic's impact on stock indices, and a pre- and post-COVID-19 analysis to compare market volatility and the market reaction to the COVID-19 announcement.

### **1.7. Organization of Thesis**

This thesis is structured as follows:

The focus of Chapter 2 is on the prior literature research in this area that has been conducted throughout many countries and how it has affected the stock markets and economies globally. A hypothesis was put forth based on reviews of the literature.

The data and methodology used to research the effect of the pandemic on stock prices are presented in Chapter 3. This section includes information about the source of the data, the total number of firms, the research model type, and the dependent and independent variables.

The data analysis and findings are presented in Chapter 4, which also provides a detailed explanation of the impact of the independent and dependent variables.

Chapter 5 examines the findings and justification for the results to understand why and how the epidemic affects stock prices by considering the literature and news in Chapter 2.

Chapter 6 concludes the study and provides recommendations and suggestions for future research work, as well as the study's limitations.

## Chapter 2

### Literature review

#### 2.1 Global economy during pandemics:

COVID-19 is not the first pandemic the world has gone through, looking back in history, many studies have found the significant impacts of previous calamities and crises on the global economy. Siu and Wong (2004) investigate that the outbreak of SARS in 2003 was an unexpected negative shock to the Hong Kong economy. The most significant negative effects have been on the demand side, with local consumption and the export of services related to tourism and air transport being severely affected in the short term. Hong Kong's labor market weakened due to lower domestic consumption and tourism spending. Once the epidemic was brought under control, the economy rebounded quickly.

In addition to the above, Ming. (2007) discovered a considerable impact on the stock market during the 2003 SARS outbreak in Taiwan. Stock prices have dropped by around 29% in the six months since the viral epidemic. Tourist arrivals in Taiwan plummeted by half during the outbreak, as SARS harmed Taiwan's international image and added to the region's unrest. This resulted in a 0.5 percent drop in economic growth.

People learn from their past experiences, so do the economies. Hong Ru. (2021) presented data that, at the time of the first known epidemic in Wuhan, China, persons in countries that experienced SARS infections in 2003 reacted more strongly to COVID-19 and fervently looked for related information on Google. Google searches indicate that the early response to COVID-19 was also accompanied by substantial drops in the stock market in nations that had already experienced SARS. While SARS-unaware nations only recently, in March, began to pay notice. In addition, compared to governments of SARS-experienced nations, the governments of these nations have implemented social distancing laws to combat 19 outbreaks far more slowly. This prompt action by both individuals and governments is highlighted more in nations where SARS-related fatalities have been reported. Additionally, COVID-19 has a more detrimental effect on investors in nations that were affected by the 2003 SARS pandemic, according to AF Perez (2021).

## **2.2 COVID-19 impact on global economy:**

COVID-19 will be remembered as a major example of neglected risk in the History. As Hong Ru (2021) investigated those countries that were affected by the SARS responded quickly as compared to other countries. Ramelli and Wagner (2020) believed the decision makers initially mainly focused on usual business risks but later their attention shifted. They compared the US and China stock market to find if there were any similar patterns in the response or not. They found the initially reaction was same in both countries, the stock prices of healthcare in both countries gained substantially, while the prices of other companies nosedived equally. The study was based on three events, one event when first case was identified in Wuhan, second the outbreak on 20 January, and third when Italy imposed a strict lockdown on 23 February.

Indeed, the COVID-19 pandemic was a "black swan" occurrence. Globally, the incident had a terrible effect. To contain the pandemic outbreak, the stock markets crashed, factories were shut down, global supply networks were badly affected, and businesses stayed shuttered. As Yilmazkiday (2021) studied utilizing daily data on the coronavirus illness 2019 (COVID-19) cases from China and the rest of the world, the global economy was destroyed. It was discovered that the Baltic Exchange Dry Index (BDI) and crude oil prices (COP) are consistent with rises in COVID-19 cases utilizing the structural vector auto-regression model. While the increase in BDI indicated the negative supply shocks in the global transportation of commodities, the decrease in COP reflected the negative demand shock in the global economy. The historical decomposition results also support the idea that the effects were primarily noticeable during the early COVID-19 period.

On March 11, 2020, nations implemented the lockdown per WHO's recommendation. N. Fernandes (2020) investigated how lockdowns affected various nations' economies. When the COVID-19 period's GDP was evaluated throughout various time periods, a drop in GDP was evident. However, even under rigorous lockdowns, the percentage of falling varied for all nations according on the scale of their economies. Additionally, after 1.5 months of initial lockdowns, the average GDP decrease was -2.8 percent, -6.3 percent after 3 months, and -10.7 percent after 4.5 months. According to the findings, COVID-19 generally costed 2% to 3% of global GDP per month, although the distribution of the recession's economic consequences was uneven.

COVID-19 had the strongest impact on the stock market of any pandemic. Even while COVID-19 had a significantly higher death toll and spread rate than the influenzas of 1957 and 1968 combined, their economic effects paled in comparison to those of this outbreak. The data pointed to social exclusion, lockdowns, recurrent waves of COVID-19 with new variations, and severe government limitations on business activities as the primary causes. (Bloom, Dave, Kost, Bloom, S. Baker, 2020)

Another study by Herninda, Hartati, and Fitria (2020) discovered that the COVID-19 outbreak had a significant negative influence on Indonesia's capital market. The stock market crashed as a result of the investors' negative reaction to the market. They determined that the widespread coverage of COVID-19, the uncertainty surrounding the pandemic, and the ongoing global situation were the causes. Additionally, Dinh and Paresh (2020) noted that stock prices behaved strangely in response to several COVID-19 events. Markets overreact to any unexpected information, and as more information becomes accessible and more individuals become aware of the implications, the market corrects itself.

### **2.3 Stock markets' reaction:**

The stock market's turbulence is influenced by investors' emotions. And among the many things that could influence investor sentiments is culture. The impact of national culture on stock market reactions to a worldwide health calamity was explored for the first time by A. F. Perez, Aaron Gilbert, Ivan Indriawan, and Nhut H. Nguyen (2021). The study discovered that during the first three weeks following a country's initial COVID-19 case notification, stock markets in nations with lower individualism and more uncertainty avoidance had larger drops and increased volatility. Furthermore, the country's stock market's cumulative anomalous returns are adversely impacted by the stringency index based on government reaction strategies. The first week following the announcement event shows strong effects on cumulative abnormal stock market return (CAR) from the degree of democracy, political corruption, and trade openness.

Taqadus Bashir (2021) expanded the research to see how markets respond to different circumstances. In order to ascertain the impact of two religious' months on the return behaviour of the gold market in Pakistan. The study's objective was to evaluate the semi-strong form of the informational efficiency hypothesis (EMH) in the gold market during religious months. For eight years, there were weekly gold prices in Pakistani rupees per one

gram. The event technique was used to track and analyze pre- and post-event reactions by computing abnormal returns. Conflicting evidence and conclusions are made for both lunar calendar occurrences because the gold market is found to be inefficient in Ramadan, but efficient in month of Muharram.

According to a detailed analysis of the S&P 1500 index by Mieszuko, Man, and Miguel (2021), the market reacted strongly to COVID. In just four days in March 2020, the market plunged 26% because of investors' panic selling of stocks. This caused the US economy's unemployment rate to rise by 20%.

In 2020, Liu H. and Aqsa M. evaluated the short-term consequences of the coronavirus outbreak on 21 leading stock market indices in significant affected countries, including Japan, Korea, Singapore, the USA, Germany, Italy, and the UK. According to their research, following the viral epidemic, stock markets in sizable, afflicted countries and areas experienced a steep decline. Asian countries have experienced more unfavorable anomalous returns in comparison.

Khanthavit A. (2020) investigated how, when, and to what events in the series the global markets responded to the COVID-19. For this inquiry, stocks markets of European countries, Asian countries and the United States were studied. The study discovered considerable, unfavorable reactions to the condition using the event-study methodology, based on stock returns. The author asserted that these responses weren't in response to the developing events and conditions that occurred, but rather to the widespread media coverage and pandemic declaration of COVID-19.

Taqadus and Shagufta (2021) investigated how the COVID-19 epidemic affected investors' attitudes, cognitive biases, and investing choices on the Pakistan Stock Exchange (PSX). Using a questionnaire and information from 401 investors who trade on the PSX, the authors evaluated the attitudes and behaviour of investors as well as the response of the stock market during COVID-19. Findings According to the findings of structural equation modelling, the COVID-19 pandemic had an impact on investor behaviour, investment choices, and trading volume. Market participants experienced anxiety and uncertainty as a result. There is evidence that investors' judgments at the PSX were influenced negatively by behavioural heuristics and biases, such as the disposition effect, the overconfidence bias, the anchoring heuristic, and the representational heuristic.



Topcu and Omer (2020) studied how COVID-19 affected stock markets in emerging economies. Between March 10 and April 30, 2020, three different events were used to study the occurrence. It was discovered that all economies saw a greater than usual impact in March, which gradually subsided by mid-April. Findings show that the pandemic's detrimental effects on emerging stock markets steadily decreased and started to taper down by mid-April. The impact on emerging markets in Asia is shown to be the greatest at this time, but it is very moderate in Europe. It was also discovered that the relationship between impact and time governments took necessary action is exact.

In contrast to other industrialized nations and emerging economies, the US stock market had positive anomalous returns from the Fed's stimulus, according to Marento and Rossi (2020). Instead of the small enterprises, the major firms benefited from the stimulus' positive anomalous returns.

Bora & Basistha (2020) examined the influence of stock on the Indian economy. For the analysis of the pre- and post-COVID-19 period in this study, the daily closing prices of the Nifty and Sensex indexes, from September 3, 2019, to July 10, 2020, were employed, along with an autoregressive conditional heteroscedasticity model on the unpredictability of equities. Findings show that during the pandemic period, there was volatility in the Indian stock market. When comparing the outcomes of the COVID and pre-COVID periods, it was discovered that the pre-COVID-19 period had a better return on the indexes.

Alam and Chavali (2020) investigated the effects of the COVID period before and after it on the Indian stock market using a market model event. The sample consisted of 31 companies from the Bombay Stock Exchange (BSE) list, and the sampling interval was 35 days. Investors anticipated the lockout accurately and reacted favorably, as opposed to the pre-lockdown period when they were afraid and hesitant to invest. Throughout the lockdown, the market showed a robust reaction with average abnormal returns that were noticeably favorable. Alzyadat and Asfoura (2021) observed how the COVID-19 pandemic affected the stock market in Saudi Arabia. They discovered that the rise of COVID-19 had a detrimental impact on stock market returns. The COVID-19 pandemic had a detrimental impact on the returns to the KSA stock market, according to the results of the Autoregressive Conditional Heteroscedasticity (ARCH) model. The outcomes also demonstrated how intense the market's negative response was in the early stages of the COVID-19 outbreak.

Ahmad A., Akhi, and Md Hasan (202) also studied the impact of Pandemic on the two all-important stock markets of Bangladesh i.e., Dhaka stock exchange (DSE) and Chittagong stock exchange (CSE) were studied using even study methodology (ESM). The result of the study shows a significant negative abnormal return with highest volatility for DSEX and CASPI during the event periods. Besides, there was a substantial decrease in the stock returns for most of the industries, particularly food, textile, ceramic, cement, and I.T. industries listed under DSE.

Khan and Zhao (2020) extended the research and found the impact of the COVID-19 pandemic on the stock markets of sixteen different countries. The study's results were estimated using pooled OLS regression, the conventional t-test, and the Mann-Whitney test. COVID-19 new cases and stock returns were collected in a weekly panel data set. The pooled OLS estimation result revealed that the growth rate of weekly new COVID-19 cases negatively predicted stock market return. The findings show that investors in some countries do not react to COVID-19 media reports in the early stages of the pandemic. However, once human-to-human transmissibility was confirmed, all stock market indices reacted negatively to the news in both the short and long-term event windows. The Shanghai Composite Index experienced a notable event; it was severely impacted during the short-event window but recovered during the long-event window. This indicates that the Chinese government's drastic measures to contain the pandemic's spread restored investor confidence in the Shanghai Stock Exchange.

Collins C. (2020) discusses the magnitude and direction of the COVID-19 pandemic's differential effect on selected world stock indexes (SSE Composite Index [China], Euronext 100 [Europe], and Dow Jones Industrial Average [United States of America]). The findings show that the COVID-19 pandemic has varying effects on the stock markets. The Dow Jones Industrial Average experienced a significant decrease in mean stock value during the coronavirus period, whereas the Chinese Stock Exchange Composite Index experienced a significant increase in mean stock value during the epidemic that was higher than before the epidemic. The S&P 500 and Euronext 100 indexes, on the other hand, show a non-significant difference in mean stock price.

Xue, Yixin, M. Umar (2021) compared the impact of COVID-19 on stock market volatility in US and China. Using a wavelet-based quantile-on-quantile method they studied that that the

impact has stronger regularity in the lower frequency domain. Compared with oil price fluctuations, COVID-19 is the main reason for the sharp fluctuation of the U.S. stock market. The strong growth of daily new cases, which continued for months, has made the U.S. stock market insensitive to COVID-19. Even though the U.S. stock market was insensitive to COVID-19, but COVID-19 was also the main factor in U.S. market crash in March 2020. While stock market of China didn't show any insensitivity as the number of daily cases continued to grow. Moreover, the extreme monetary policy in U.S. was able to suppress the volatility of U.S. stock market. Under the background that COVID-19 is not effectively controlled, a loose monetary policy may be an expedient measure to stabilize the market. This is of great practical significance towards achieving epidemic control and financial market stability under the background of the global spread of COVID-19.

Ashraf B. (2020) examines the stock market's response to the COVID-19 pandemic using daily COVID-19 confirmed cases and deaths and stock market returns data from 64 countries over a four-month period during COVID-19. The stock markets reacted negatively to the increase in COVID-19 confirmed cases, with returns declining as the number of confirmed cases increased. Furthermore, it was discovered that stock markets reacted more proactively to an increase in the number of confirmed cases than to an increase in the number of deaths. According to the analysis, the negative market reaction was strongest during the early days of confirmed cases and then between 40 and 60 days later. Overall, the stock markets reacted quickly to the COVID-19 pandemic, though this response varies depending on the stage of the outbreak.

Zeren and Hizarci (2020) suggested investors to avoid investments in stock markets during pandemic time, and resort to investment in gold markets, which is the safe investment port of each crisis period in long run. Also, contemplating all the businesses moving towards internet world, turning to cryptocurrencies is seen as another alternative option for investors.

#### **2.4 Impact on different sectors:**

The surge of Novel Corona Virus globally has resulted in economic disruptions, market crashes and employment. The financial markets of every country in the world have responded negatively to COVID-19. Since COVID-19 halted major sectors around the world, but some sectors have been operating and pushing their limits to survive. Lai Cao (2021) also studied banking stocks in the Vietnamese stock market. The result was like other studies that the

market responded drastically in the first event when only a few cases were diagnosed. But with the passage of time and with the increase in cases around the world, the market has become somewhat stable. Even when the third happened, imposing a nationwide lockdown, the stock exchange responded overwhelmingly to it.

Similarly, Khao (2020) investigated the early effects of the COVID-19 pandemic on stock returns in 11 sectors and ten nations. During the outbreak, investors across different sectors and countries responded differently. Communication Services, Health Care, Information Technology, and Utilities sectors consistently perform relatively well, compared to other sectors, in all countries except Italy, Japan and U.S. While energy sectors in the United States, United Kingdom, Canada, and Italy suffered the most. Mieszuko and Mand (2021) discovered that at the early stage of COVID-19, shares in the natural gas, food, healthcare, and software sectors in the United States achieve large positive returns, whereas share prices in the petroleum, real estate, entertainment, and hospitality sectors plummet dramatically. Furthermore, the transportation industry has witnessed a declining trend as sudden stops in movement have resulted in massive financial losses, and the aviation industry all over the world has seen a considerable downturn (Keziban and Akpinar 2021).

From November 1, 2019, to June 8, 2020, Xia and Hu (2020) examined 223 pharmaceutical stocks from the CSI 300 index (based on the Baidu Index). The study used the Fama-French three-factor model to explain the impact of investors' growing concern about the epidemic on pharmaceutical stock using three dependent variables: return rate, trading volume, and amplitude. The findings show that investors' focus on COVID-19 has a significant positive impact on the pharmaceutical stock market's return, volume, and amplitude during the same period.

Elsayed A. (2020) investigates the effects of the COVID-19 spread on the Egyptian Exchange's Indices Sectoral. The returns of the Egyptian stock market's daily sectoral indicators serve as the dependent variable, representing how the Egyptian sectoral indicators responded to the daily new instances of the Corona virus. Between March 1, 2020, and May 10, 2020, this was used on a daily basis. According to the findings, stock market sectors' returns appear to be more sensitive to overall mortality data than to daily corona virus deaths and new cases.

In another Event study by Lai Cai, the relation of COVID-19 on stock price of pharmaceutical industries in Vietnam was studied. The relationship and reaction of stock prices to COVID was studied during 3 events, first when only one patient was diagnosed, second when the internationally lockdown was imposed, and third when the country-imposed lockdown. The study found that the impact of the three events on pharmaceutical stock prices was sign inconsistency. Cumulative abnormal returns (CAR) were positive after the first and third event is declared but the CAR is negative after the second event is announced. Of the three events, the stock price response to the third was the slowest.

With a similar approach Aravind M. and Manoj (2020) examines how COVID 19 outbreak has affected leading pharmaceutical stocks listed with the National Stock Exchange of India. Results reported that momentum effect is persisting with pharmaceutical stocks as the stocks are moving in harmony with the index. This study also signifies that certain companies with strong brand reputation were seems to be sustaining in the crisis period despite the general falling market trend. Study by Shivam and Dipasha (2020) observed that there had been significant abnormal returns and cumulative abnormal returns in healthcare and pharmaceutical sector over the event window, though while comparing it with other sectors the returns were not statistically significant.

Compared to other major sectors like health, petroleum, banking, COVID-19 also impacted the telecommunication sector. The study by Riska, Bintang, and Florida (2021) in Indonesian stock markets, investigated the effect of COVID-19 on telecommunication sector. Share price of different companies 5 month before and 5 months after COVID was analyzed. The share prices of telecommunication companies significantly dropped during the COVID period. The average cumulative share price before the announcement was IDR Rp 2,596.66 and after was IDR Rp 1,910.43.

## **2.5 COVID-19 and Pakistan:**

Pakistan has been one of the worst-affected countries by COVID-19, with the pandemic's economic disruption exacerbating an already-existing crisis. S. Sareen (2020) discusses how the public health crisis has impacted some of Pakistan's most critical sectors. Even though the government implemented some relief measures, they were insufficient to counteract the pandemic's impact. A. Javed (2020) investigated the impact of COVID-19 on Pakistan's services sector. Tourism, hospitality, and transportation are likely to be the most affected

sectors in the services sector. He predicted that millions of SMEs would be unable to survive in the long run due to a lack of funds, and that SMEs' revenues would also fall. The lockdown situation has resulted in vulnerable employment and layoffs in every region of Pakistan.

H. H. Hamid (2020) investigated the effect of COVID-19 on the Pakistani stock market. According to an Industry Level Return Analysis, many businesses simply survived the crisis, while a few made a profit, while many other sectors clearly suffered greatly. Transportation, leisure, hoteling, and airlines will be definite losers, while home distribution providers and face-mask manufacturers will be potential winners. During the first month of COVID-19, the power, transportation, chemical, banking, and automobile industries suffered the most. For example, the petroleum market is made up of several oil companies that will fail in a crisis, and transportation corporations are reducing both human traffic and transportation. Companies in the medical field have emerged as clear winners in other countries, but not in Pakistan. The Goods and Services and Utility sectors are the only ones in Pakistan that have outperformed other industries, as demand for facilities that aid in domestic employment has skyrocketed. Utilities have benefited significantly, most likely because these companies rely less on foreign markets and competition.

The Pakistani Planning Commission said the virus would lead to a loss of 0.8-1.3% of GDP, (M. Haider, 2020) which would bring growth from 3.3% to around 2.5%. Towards the end of February, there was a possibility that the pandemic could result in negative growth in Pakistan. Textiles, which account for nearly 60% of total Pakistani exports, rely on China for 70% of their input needs. Import costs from China increased by up to 100% overnight. Because Pakistan had banned all trade with India, the only options were South Korea and Taiwan, both of which had raised prices by 30-35 percent. (2020 Express Tribune)

Pakistan's privatization drive pushed back because Chinese firms that expressed interest in taking over some of the power plants on the block withdrew. Moody's revised its growth forecasts for Pakistan on a regular basis. It forecast GDP growth of around 2.9 percent in fiscal 2020 in December 2019, just before the pandemic hit the world. Because of the government's higher debt burden and weaker budget balances, this had been reduced to 2.5 percent by mid-March; by the end of March, it had fallen to two percent. (Moody's 2020 report)

During this period, small and medium-sized businesses suffered the most. A one-day nationwide lockdown costed the economy more than PKR60 billion in 2014. Extrapolating this and adjusting for 2020, the economy would lose at least PKR 100 billion per day, which is confirmed by early April estimates, resulting in a loss of PKR 2.5 trillion. Small businesses in Rawalpindi's main commercial centres are losing more than PKR 600 million per day. The association of large organized taxpaying retailers claims a PKR 900 billion loss during the 45-day lockdown. (S. haq 2020)

## **2.6 Hypothesis**

Literature reviews suggest that COVID-19 has severely affected financial markets around the world. On March 16, 2020, the DOW fell nearly 3,000 points, or 12.9%, a massive drop in post-WWII history. The pandemic situation of uncertainty has made stock markets volatile and unpredictable. It can be observed that the stock market reaction varies across countries, depending on the severity of the outbreak. Also, some sectors have performed well in some countries, for example, the pharmaceutical and banking sectors have performed well in many countries during the pandemic (khao 2020). However, according to various studies, these reactions were triggered by COVID-19's extensive mainstream coverage and global epidemic declaration, rather than by the evolving events and situations that occurred. Therefore, it is important to know whether the pandemic have had any impact on stock returns of pharmaceuticals, banking and telecommunications sector in Pakistan, or not. Following hypothesis are proposed:

**H<sub>0</sub>**: Pandemic announcement had no impact on stock returns

**H<sub>1</sub>**: Pandemic announcement had an impact on stock returns

## **Chapter 3**

### **Data and Methodology**

This paper aims to look as to how stock prices reacted to COVID-19. Secondary sources of information were used to compile the data for this study. The investing.com website has compiled historical data on the daily closing stock prices of the three industries (banking, pharmaceuticals, and telecommunications) and cross-referenced it with historical data on the PSX (Pakistan Stock Exchange) official data portal. This study compares the stock market's response to the pandemic announcement before and after the COVID-19 pandemic. The WHO report states that the first COVID-19 case was recorded from Karachi on February 26, 2020, and that Pakistan's government implemented the first nationwide lockdown on March 23, 2020. (Dawn, 2020). Thus, the Pre-COVID Era, which runs from March 1, 2019, to February 28, 2020, and the Post-COVID Era, which runs from March 1, 2020 to March 31, 2021.

Closing prices of three sectors have been compiled daily: banking, pharmaceuticals, and telecommunications (all accessible data). Eight listed firms are in the pharmaceutical industry, four are in the telecommunications sector, and 15 listed companies are in the banking sector (commercial banks). There were only four listed companies for telecommunication under the heading of Telecommunication and technology, the rest were for technology sectors. Only the listed companies were taken, and those that had available data were then narrowed down. For instance, some of the listed companies for pharma had data availability restrictions.

Following the daily stock closing price data collection, the data was organized and divided into pre-COVID dates and post-COVID dates. The average daily closing price of all companies was calculated for each industry. Then, daily historical stock index data was gathered from March 1, 2019, to March 31, 2021. For each sector and each event period, linear regression analysis was used. Regression analysis would reveal whether the test values are significant and whether the return has a negative reaction or not. The following provides a list of the businesses chosen based on data accessibility.



<b>BANKING</b>	<b>BANKING</b>	<b>PHARMACEUTICAL</b>	<b>TELECOMMUNICATION</b>
Allied Bank ltd.	Faysal Bank Ltd.	Abbott Lab (Pakistan) Ltd.	Pakistan Telecommunication Company Ltd.
Meezan Bank	Habib Bank Ltd.	AGP Ltd.	Pak Datacom Ltd.
Askari Bank Ltd.	Habib Metropolitan Bank Ltd.	Ferozsons Laboratories Ltd.	Telecard Ltd.
Bank Alfalah Ltd.	JS Bank Ltd.	GlaxoSmithKline Consumer Healthcare	WorldCall Telecom Ltd.
Bank Islami Pakistan Ltd.	MCB Bank Ltd.	Highnoon Laboratories Ltd.	
Bank AL Habib Ltd.	National Bank of Pakistan	Macter International Ltd.	
Bank of Khyber	United Bank Ltd.	Sanofi-Aventis Pakistan Ltd.	
Bank of Punjab		The Searle Company Ltd.	

Table 3-1 List of selected listed companies

### **3.1 Research Model**

The purpose of the study is to investigate how stock prices responded to the COVID-19 outbreak. Its goal is to determine how COVID-19 has affected Pakistan's banking, telecommunications, and pharmaceutical industries' stock prices.

The stock market's response to COVID-19 has been the subject of several research projects. There have been many different study models employed, but the majority have been divided into two mains. The first group of researchers employed "event study methodology" to

examine how COVID-19 outbreak and earlier pandemics like SARS and Ebola affected the stock market. The stock markets of France, Germany, Italy, Spain, the US, the UK, China, the Philippines, and Thailand were studied using the event study method of Khanthavit A. (2020). The author discovered a sizable adverse response. Similarly, Aravind (2020), Ramelli and Wagner (2020), Ru, Yang, and Zou (2020), and Topcu and Omer (2020), used event studies to discover the detrimental effects on various nations' stock markets.

The second group of researchers used regression analysis to determine how stock markets reacted to the coronavirus outbreak. Yilmazkuday (2020), Zeren and Hizarci (2020), A. Shehr Yar (2020), M. Ghadeer & O. Janjua (2020), and N. Fatima & U. Elahi (2020) employed regression analysis to determine the influence of COVID-19 on stock markets around the world.

Based on previous research that employed "regression analysis" to determine the reaction of stock returns to COVID-19, regression analysis was applied in this study. The use of regression analysis is justified since the purpose of this study is to investigate the rampant effects by comparing stock prices in the pre-COVID era.

$$\text{PRICE}_{t1}^1 = \alpha + \beta_1 \text{INDEX}_{t1} + \varepsilon_{t1}$$

PRICE<sup>1</sup><sub>t1</sub> represents the daily closing price of stocks in one sector in the above regression equation, and 't1' represents the pre-COVID time period. INDEX<sub>t1</sub> denotes the daily closing Index points of the KSE-100 index prior to COVID, whereas β<sub>1</sub> denotes the relationship to which the dependent variable is reliant on the independent variable. ε<sub>t1</sub> is an error term.

Name	Type	Measurement
PRICE <sup>1</sup> <sub>t1</sub>	Dependent Variable	calculated using the daily closing price of stocks from Investing.com and the PSX official data portal
INDEX <sub>t1</sub>	Independent Variable	calculated using the daily closing price of Index from

		Investing.com and the PSX official data portal
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Table 3-2 Variable, measurements and sources

## Chapter 4

### Data analysis and Results

The data analyzed data is explained in the following sections through descriptive statistics, correlation analysis, and regression analysis.

#### 4.1 Banking sector

Table 4-1 Regression Analysis of Banking Sector

	Pre-COVID	Post-COVID
<i>R Square</i>	0.51092634	0.761500801
<i>Intercept</i>	31.90672713	13.97415782
<i>Index</i>	0.000821166	0.001013604
<i>t Stat</i>	8.28905051	10.14214686
<i>P-value</i>	1.05204E-14	1.11372E-20

From the regression results, the value of R-square indicates that the independent variable had substantial impact on dependent variable. The R-square value is 50% in pre-COVID and 76% in post-COVID, which indicates a significant impact of independent variable on dependent variable.

In the Pre-COVID era, regression shows that,  $PRICES = 31.90 + 0.0008 INDEX$ , where t value is **8.2** (>2), hence significant, and p-value is **1.05E-15** (<0.05), significant as well. This

relationship shows that with an increase of 1 point in Index, the stock price of banking sector increased by **0.0008 points**.

In the Post-COVID era, regression shows that,  $PRICES = 13.90 + 0.001 INDEX$ , where t value is **10.14** ( $>2$ ), hence significant, and p-value is **1.13E-20** ( $<0.05$ ), significant as well. This relationship shows that with an increase of 1 point in Index, the stock price of the banking sector increases by **0.001 points**. This is a significant increase in the prices during the COVID-19 period, which implies that COVID-19 did impact the stock prices.

The P-value corresponding to T-value shows a statistically significant relationship between the predictor variable (stock-index) and response variable (stock prices) thus the null hypothesis is rejected. As the alternate hypothesis stands true, it is significantly proved the pandemic had a significant impact on stock returns in banking sector of Pakistan. However, the impact seen is significantly positive during the COVID-19 period.

## 4.2 Pharmaceutical sector

Table 4-2 Regression Analysis of Pharmaceutical sector

	Pre-COVID	Post-COVID
<i>R Square</i>	0.709216027	0.772624901
<i>Intercept</i>	-249.7944522	32.26279851
<i>Index</i>	0.012782341	0.007934218
<i>t Stat</i>	-12.54257608	3.085969019
<i>P-value</i>	1.23799E-27	0.002240611

The R-square value for pharmaceutical sector is in 70% in pre-COVID and 77% in post-COVID, which indicates a significant impact of independent variable on dependent variable.

The Pre-COVID regression shows  $PRICES = -249.7 + 0.01 INDEX$ , where absolute t value is **12.4** ( $>2$ ), hence significant, and p-value is **1.23E-27** ( $<0.05$ ), significant as well. The Coefficient value is negative, which represents the direction of the predictor vs response variable. This means that as our index increases (independent variable) stock prices decreases (dependent variable). If we reform our formula, then Price= - (249.7 – 0.01 index). This

relationship shows that with an increase of 1 point in Index, the stock price of the pharma sector decreases by **0.01 points**.

In the Post-COVID era, regression shows that,  $PRICES = 32.26 + 0.007 INDEX$ , where absolute t value is **3.08** (>2), hence significant, and p-value is **0.002** (<0.05), significant as well. This relationship shows that with an increase in 1 point of Index, the stock price of the pharma sector increased by **0.007 points**. The significance of returned P-value rejects the null hypothesis. And the alternate hypothesis stands true, it is significantly proved the pandemic announcement had significant impact on stock returns in pharma sector of Pakistan. Moreover, the impact seen was significantly positive as compared to pre-COVID period.

### 4.3 Telecommunication sector

Table 4-3 Regression Analysis of Telecommunication sector

	Pre-COVID	Post-COVID
<i>R Square</i>	0.58268611	0.64218102
<i>Intercept</i>	11.9044826	27.63456054
<i>Index</i>	0.000269386	0.001139385
<i>t Stat</i>	3.780194357	13.37703986
<i>P-value</i>	3.57279E-05	1.24586E-31

The R-square value for telecommunication sector is in 58% in pre-COVID and 64% in post-COVID, which indicates a significant impact of independent variable on dependent variable.

In Pre-COVID era regression analysis returns values as  $PRICES = 11.9 + 0.00026 INDEX$ , where absolute T-value is **3.78** (>2) hence significant, and P-value returned as **3.572E-05** (<0.05) which is significant. The relationship expresses that for every point increase in index, stock prices increase by **0.00026 points**.

In Post-COVID era regression analysis returns a value as  $PRICES = 27.63 + 0.00113 INDEX$ , where absolute T-value is **13.37** (>2) hence significant, and P-value as **1.24E-31** (<0.05) hence significant. The relationship shows that for every 1-point increase in index, the stock prices increase by **0.00113 points**.

The significance of returned p-value and t-value rejects the null hypothesis. The alternate hypothesis stands true, it is significantly proved the pandemic announcement had a significant impact on stock returns in telecommunication sector of Pakistan. However, the impact was significantly positive as compared to pre-COVID period.

## Chapter 5

### Discussion

The aim of this study is to show the impact of Covid-19 on stocks in Pakistan. The financial sector responds to events that results in either positive or negative market reaction. The event study selected duration is of two years that is categorized in two eras namely pre-COVID and post-COVID. Our selection of dates is from March 2019 till end of March 2021, of which pre-era is till 28<sup>th</sup> of February. The past scholarly work produced, and market dynamics all indicate a negative market response to the announcement of pandemic; overall, the downturn in economic activity was a global effect. As identified in problem statement the study focuses specifically on three sectors in Pakistan. These three sectors are Telecommunication, Pharmaceuticals and Banking. The motive of the study is that when all economic activity came to a halt, under lockdown, masses stayed at home. Firstly, main essentials (apart from grocery and food) were medicines due to eminent health threats; people were stocking over the counter medicines. Secondly as governments forced masses to stay at home and that certain level of essential economic activity could not be delayed, such as work and study, organizations shifted to work from home and online classes module in order to keep somewhat working. This was a breakthrough for technology and telecommunication sector in the midst of the crisis. Lastly, the Government of Pakistan devised policies to encourage borrowings and also provided aid in order to cope with crisis (SBP report, 2020), (S. Shahid, 2020), so that money could be circulated, and some activity could be generated. In contrast past studies suggest that economies tend to over-react to information and events; Siu and Wong (2004) by studying SARS impact on Hong Kong in 2002 said that economies negatively react to global crisis, as Khanthavit A. (2020) concluded that markets over-react to information as perceptions are carried and hence sellers made stock sales in panic beforehand. Moreover, the findings related to influence of pandemic on Indian economy stocks show high volatility, Bora and Basistha (2020) concluded that the pre-COVID era had a better return on stock indices than the post-COVID.

## Chapter 6

### Conclusion and Recommendations

#### 6.1 Conclusion

The novel corona virus outbreak announcement globally resulted in negative impact on markets in general, but few sectors such as technology, telecommunication and somewhat Banking were the most streamlined in-use during the imposition of preventive measure (lockdowns) globally. According to Eugene Fama's Efficient market hypothesis (CFI, 2022), the financial sector prices go up or down in a timely or up-to-date manner and hence the basic idea of Fama's work that it is nearly impossible to "beat the market", this concludes that stocks always trade at their fair market value. This rampant effect study findings indicate that the market is in-efficient, and that the pandemic announcement had positive impact on these three sectors. For the findings on banking sector, the results show that pre-COVID stocks returns were less as compared to post-COVID stocks returns by a percentage of 0.02 percent (difference of both beta). The pharmaceutical sector test returns for pre-COVID era showed a negative directionality of mean. With increase in index prices the stock prices were decreasing, but in the post-COVID era the coefficients and t-stats returned did not show a negative directionality and rather indicates a positive influence on stock prices. The telecom sector also returned increased values for beta and coefficients that point towards an increase in stocks prices as a result of the pandemic. In all three sectors we saw an uprising in prices as resultant of the pandemic announcement and till date. The study thus concludes that although the pandemic had negative impact on stock market, these three sectors received a positive reaction from market and sustained.

#### 6.2 Limitations of study

The study determines the influence of COVID-19 on the stock prices of Pakistan's pharmaceutical, communications, and banking sectors. The study has certain limitations. The stock market reacts to a range of factors, including government policies, natural disasters, international events, and news distribution (Hillier and Loncan, 2019). Pakistan, like other nations, suffered from the COVID-19 pandemic; yet, being a developing country, Pakistan was already experiencing economic challenges prior to the COVID-19 epidemic. To prevent



the country from entering a recession, the government implemented various policies to stimulate the economy, such as giving subsidies, launching relief programs, tax breaks for specific sectors, and changes in fiscal policies (S. Shahid, 2020), which altered the true impact of COVID-19 on stock prices.

Another limitation of the system is the lack of data availability. Data on stock prices for several firms, as well as the index, for various dates in 2019 and 2020, was not available. This had an effect on our regression results, lowering the accuracy of the results we obtained. Finally, the authors' lack of experience is another disadvantage of this study.

### **6.3 Recommendations**

After a thorough analysis of data, the following recommendations are hereby made:

- 1- Macroeconomic, financial, geopolitical, political, and epidemic events have a significant impact on stock markets (Niderhoffer, 1971). The information at hand in these circumstances has a significant impact on the decisions made by investors. According to the findings, stock prices in the studied sectors significantly increased in the post-COVID era. The reviews of the literature also show that the same phenomenon occurred in other countries. During the COVID-19 time, these three industries—banking, pharmaceuticals, and telecommunications—performed relatively well than other sectors. (Khao, 2020). The governments across the world adopted supportive policies for them as well, which led to expansion. Investors are advised to wait for the acts of governments and the policies they create in such circumstances rather than buying and selling in a panic.
- 2- Investors in countries that had previously experienced pandemics made prudent decisions and made the investment in pharmaceutical firms there (AF Perez, 2021). Investors in Pakistan are advised to make investments in health-related businesses in such circumstances. Their investments would enable the businesses to operate efficiently, and investors would gain greater advantages in return.
- 3- It is advised that governments follow the example of Pakistan, which was set by the sensible decisions made to support businesses during the COVID-19 pandemic by decreasing borrowing rates and implementing business-friendly laws (S. Sareen, 2020). Borrowing was encouraged by the reduced interest rates, and banking sector

performed well during this period, as evidenced by the rise in stock values during the post-COVID era. Furthermore, Pakistan's government also adopted smart measures such as Ehsas programs, tax-free remittances, and lower taxes to boost exports. These actions can be taken by governments of other countries in similar unfortunate circumstances to prevent recession.

#### **6.4 Suggestions for future research**

The effects of COVID-19 were more severe than ever before; following the 2008 Great Recession, economies suffered greatly during this pandemic. Scholarly work has been produced to study the impact of this pandemic on economies and the financial world. This study adds to the field's literature and provides insight into the impact of COVID-19 on Pakistan's banking, pharmaceutical, and telecommunications sectors. The study's limitation is that it only focuses on three sectors in Pakistan. It may be useful to broaden the literature to include other sectors as well, or to compare these sectors with other countries in the region to conduct a comparative analysis of how each sector responded. Furthermore, a different research model (e.g., event study methodology) could be used to determine how each sector responded to different announcements during specific time periods.

Furthermore, important economic variables such as economic policy, fiscal measures, inflation, and so on were not taken into account. The index and daily closing prices of stocks before and after COVID-19 were used in this study. Other variables, such as new cases, daily deaths, the number of recovered patients, and economic variables, could produce more precise results in future studies.

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