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“FINANCIAL IMPACT OF CORONAVIRUS ON PAKISTAN”

NAME: Gulwish Cheema

ENROLLMENT: 03-321191-002

SEMESTER: Spring 2020, MBA - III

PROGRAM: MBA 1.5 (Finance)



DEPARTMENT OF MANAGEMENT SCIENCES

BAHRIA UNIVERSITY LAHORE CAMPUS

RESEARCH THESIS

Principal Supervisor: Dr. Adnan Hushmat

SUBMISSION FORM of THESIS

Candidate Name: Gulwish Cheema

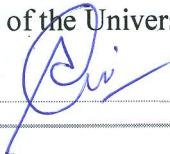
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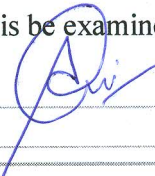
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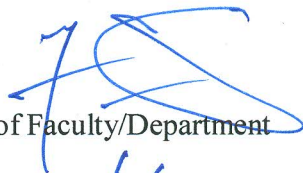
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I, Gulwish Cheema, student in the Department of Management Sciences, Bahria University, Lahore Campus, certify that the research work presented in this thesis is to the best of my knowledge, and solely my own. All resources used and the help received in the preparation of this dissertation have been acknowledged. I hereby declare that I have not submitted this material, either in whole or in the part, for any other degree at this or other institution.



Gulwish Cheema

ACKNOWLEDGMENTS

First of all, I would like to thank Almighty Allah for blessing me with strength, courage, determination, and self-motivation to undertake my research work. Next, I would take this opportunity to express my heartfelt gratitude as well as thank my thesis supervisor, Dr. Adnan Hushmat for giving me the opportunity of researching such a unique topic. I am immensely grateful to him for his continuous guidance and support throughout the semester in addressing frequent queries regarding my research topic. I also thank him for introducing me to the research methodology which I have used in my research work for analysis and decision purposes. Getting to study and know this methodology has indeed enriched my knowledge and will surely aid me in my future research projects.

I owe a big thanks to Bahria University, Lahore Campus for establishing such a qualified team of research supervisors and coordinators who did not fail at any point to guide their students and helped me in every way possible to meet my deadlines with proper support. The university has indeed succeeded in providing a useful platform for its students and fulfilled its promise and trust envisioned by enrolled pupils. I would also like to take this opportunity to thank the university's dean for laying out a systematic framework for research students studying at Bahria University, Lahore Campus. Added to this, I would like to appreciate the Head of the Department of Management Sciences, Dr. Ahmed for ensuring a friendly environment within the university and allowing students to voice their opinions and show their creativity. Only in such an environment can students of essence flourish for real. I cannot ignore the efforts put in by our university's research coordinator, Dr. Saif ul Haq who was very welcoming and quite efficient at managing such a large pool of research students in an adequate manner.

Lastly, I would like to thank most deserving worthy of appreciation, my late parents who never failed to guide me and direct me towards the ladder of success. Their absence pressurized me to take every opportunity as a challenge and fulfil their hopes they always had from me. This sense of motivation helped me a lot to prove myself and get this thesis project completed within time.

ABSTRACT

The primary objective of this research paper was to study the financial impact of Coronavirus (COVID-19) on Pakistan's economy as a whole by studying major listed industrial sectors of the country. The analysis was conducted by thoroughly studying pre-COVID-19 and post-COVID-19 situation. To perform this task, the data sample for pre-COVID19 was collected from 1st January 2019 to 25th February 2020 since the initial case of Coronavirus appeared in Pakistan on 26th February 2020. Further, for the post-COVID-19 data sample from 26th February 2020 till 31st May 2020 was gathered.

Both return and risk volatility analysis was conducted, by applying respective methodologies separately to two sets of data to gain a better understanding of the after-effects of Coronavirus. For return volatility analysis, Event Methodology was used by calculating abnormal returns, while for risk volatility study, the ARCH model was applied. Hypothesis testing mainly involved an assessment of the effect of COVID-19 on each of the 15 sectors selected for Pakistan based on its Market Capitalisation share in the country. The analysis showed that overall all of the sectors got a serious hit with a different magnitude due to the outbreak of pandemic in the country. The most severely got affected were the ones that did not have any support from the government of Pakistan in the form of subsidy or aid. Also, the ones that could not rely on technology to transform its business model.

Interestingly, COVID-19 along with calamities for many individuals and long-established businesses resulted in new opportunities as well. This involved mostly the dire need to establish strong IT technology to take all of the businesses online since the customers shifted to prevent catching virus through physical contact. Pakistan, being a developing country had to face a lot of problems as a result and many of its vulnerabilities got to light when the entire country's operations were exposed due to novel coronavirus, depicting how the country lacked in terms of technological infrastructure.

(Keywords: Financial Impact, Coronavirus, Pakistan, Financial Uncertainty, Sectoral Impact, Investment Opportunities, Transformation of Businesses, Rise of E-Commerce)

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CHAPTER 1

1. INTRODUCTION

1.1 Background

The year 2020 started with the whole world involved in a serious war against the pandemic, fearing their life and survival. As the reported cases took a sharp upward direction, uncertainty within the economy worldwide rose, strongly challenging health facilities and the financial stability of all the countries, especially developing nations such as Pakistan. The world is referring to Pre-COVID-19 and Post-COVID-19 due to the significance of the impact it has had over all the countries, including even those considered to be superpowers. During the second half of 2019, it was quite clear that the global economy was entering a period of recession but the situation was expected to get better in the year 2020. Unfortunately, due to COVID-19, all forecasts for the year 2020 had to be revised.

The financial uncertainty posed by COVID-19 is quite worrisome as it has infected the economies in various ways. At first, it attacked the aggregate demand in countries, as a result of strict measures taken by the governments to combat the virus. With the slowdown in the economy, the situation worldwide worsened due to a sharp increase in the unemployment rate as many organizations including MNCs reacted by immediate layoffs of employees to save costs. Due to these layoffs, the disposable income of related households got affected, giving demand shock in the economy. This vicious cycle further got escalated due to a decrease in remittances and foreign payments.

1.2 Research Gap

The wave of COVID-19 had immense repercussions on the entire world, even the ones possessing developed status were not prevented from its impact. Numerous studies were conducted in China, the US, and Europe concerning this deadly virus. However, there remained a lot of room of research on how Pakistan suffered from its impact, mainly what

financial repercussions it had to face. Since the spread of the virus was a new discussion, there was very little work performed in this area. Most of the work conducted revolved around medical discussions with little analysis of financial impact. No work was performed on the financial impact of this virus solely on Pakistan.

1.3 Problem Statement

With the spread of the COVID-19 pandemic, the entire world had to bear the consequences. With an increase in the number of patients and the death toll, the recession took its turn as well. With great pressure on the health care system and the government to deal with the spread of this disease, investors and businesses faced a real challenge as well while the stock markets faced bearish trends. No constructive study existed at the moment based on which investors and organizations of Pakistan could make informed decisions for future investments. This study has addressed this problem and will provide a solution for current and future investors both local and foreign-looking for opportunities to enter or exit a business operation in Pakistan.

1.4 Research Questions

- Financial Impact of Coronavirus on Pakistan?
- Which sectors suffered the most hit?
- Which sectors continued to maintain their position?
- Which sectors did the best during a pandemic?

1.5 Research Objectives

The specific ambitions of this research work are:

- To examine the financial impact of novel Coronavirus (COVID-19) on Pakistan
- To evaluate the intensity of this impact on the economy of Pakistan
- To analyze which of the sectors of Pakistan got the most financial hit as a result
- To determine which of the sectors are safe from this pandemic and likely to prosper despite the increase in the spread of such pandemic

1.6 Significance of the Study

This study will exploit the untapped area of research with the provision of in-depth knowledge concerning the financial impact of COVID-19 on the country of Pakistan. This will enlighten those interested in studying the financial impact of COVID-19 on the country of Pakistan as a whole as well as getting a thorough understanding of which of the sectors suffered the most. Further, this research will help the future as well as current investors to align their investment plans according to results portrayed by this study and stay as safe as possible from sectors that are likely to suffer as a result of the COVID-19 recession. The investors can make informed decisions as a result and shift towards sectors that are expected to survive and grow as a result of the post-COVID-19 situation.

CHAPTER 2

2. LITERATURE REVIEW

2.1 Coronavirus (COVID-19)

2.1.1 Overview

COVID-19, widely known as an unusual coronavirus is categorized as a novel type of coronavirus. The syndrome triggered by this unique coronavirus was first acknowledged in the city of Wuhan, China. It inherited its name as coronavirus illness 2019 (COVID-19) whereby 'C and O' depicts corona, 'V and I' the virus, whereby 'D' is for the disease. Previously, this sickness was discussed as the 2019-coronavirus or shortened to 2019 nCoV. COVID-19 disease is a different kind of virus that is connected to a similar category of viruses such as Severe Acute Respiratory Syndrome (SARS) and even a few categories of the common cold. Characterization of COVID-19 as a pandemic does not signal that the virus has turned out to be deadlier. It is an acknowledgment of how far the disease has spread geographically. (World Health Organization, 2020)

This virus transmits through straight contact with respirational droplets coming from an infected person which are produced through sneezing and coughing, as well as touching exteriors that are contaminated with the virus. This virus may live on surfaces for numerous hours but can be destroyed by simple antiseptics. Symptoms consist of mild to high body temperature, cough, as well as difficulty breathing. In other severe circumstances, such type of infection can end up becoming pneumonia or result in an inability to breathe. In rare circumstances, the disease can become fatal. (UNICEF, 2020) These indications are quite comparable to flu (widely known as influenza) otherwise to the usual cold, which is way further commonly observed diseases compared to COVID-19. This explains the need to conduct more testing to approve if someone has COVID-19. Key precautionary measures listed out by World Health Organization (WHO) are quite basic and easy to follow including, frequent washing of hands and respiratory cleanliness i.e. shield your cough and/or sneeze by use of tissue or flexed

elbow, followed by immediately getting rid of the tissue into a closed bin. (World Health Organization, 2020; UNICEF, 2020)

2.1.2 The Emergence of COVID-19

On the date of 31st December 2019, a notification was sent to the World Health Organization (WHO) regarding pneumonia cases without any basis, identified in the city of Wuhan, Hubei, China's Province. During the tenure, December 31st of 2019 to January 3rd of 2020, around forty-four cases with pneumonia of unidentified aetiology were informed to WHO institute via national authorities of China. On 11th as well as 12th of January 2020, the institute of WHO received additional thorough information from the Institute of National Health Commission China regarding the outbreak's reason which turned out to be exposed in one of the seafood markets in the city of Wuhan. (World Health Organization, 2020)

2.2 COVID-19 Highlights

2.2.1 Worldwide (Jan – May 2020)

By 20th January of the year 2020, cumulative two hundred and eighty-two cases were confirmed and reported from countries comprising South Korea, Japan, Thailand, and China. These cases were exported from the city of Wuhan, China. Out of the 278 confirmed cases, around fifty-one cases were severely ill, with twelve in life-threatening conditions and six reported deaths from the city of Wuhan. On 21st January 2020, the United States announced its 1st confirmed case of coronavirus. By 23rd January 2020, China locked the entire city of Wuhan, consisting of 11 Million people, under strict isolation orders. All flights, as well as trains departing from the city, were cancelled, and all kinds of public transport including ferries, subways, and buses within the city were suspended. On 30th of January 2020, this pandemic was declared as a global public health emergency by WHO as more than 9,000 cases were reported worldwide, including in 18 countries beyond China. On 31st January 2020, the White House announced that it would ban the entry of most of the foreign nationals having the travel history of China in the last fourteen days. (World Health Organization, 2020) (NBC News, 2020)

On 2nd February 2020, first coronavirus based death was reported outside of China, including a forty-four-year-old resident of Wuhan, who passed away in the Philippines. On the 8th of February, the 1st citizen of the United States died from COVID-19 in Wuhan. On February 11th, the WHO announced that the new coronavirus will be officially known as COVID-19. By 14th February, this deadly virus reached Egypt, with the first reported case, making it the first country in Africa to be affected. Globally death toll passed 1,500 including 3 outside China. On the same date, the first case outside Asia was also reported, with a Chinese tourist dying in France due to this virus. The day of 24th February made Italy the worst-hit country in Europe as cases spiked with health officials reporting 6 deaths from this deadly virus. On the same day, US stock market plummeted over coronavirus fears, soon after Dow Jones Industrial Average went through the worst day in 2 years. On 26th February, California announced the first case in the US without any clear source of exposure with Brazil confirming its first case as well. President Donald Trump imposed additional travel restrictions by 29th February, including with Iran along with warnings about travel to South Korea and Italy. With this came the first death reported in the US, Washington DC. (World Health Organization, 2020) (NBC News, 2020)

By 8th March, Italy imposed a strict lockdown as confirmed cases crossed 5,800 with more than 230 people dying from the virus. With the world getting affected as a whole, on 11th March 2020, the World Health Organization declared that the coronavirus outbreak can be termed as a pandemic. On 13th March, WHO stated that Europe has turned into an epicenter of the pandemic with increased reported cases of patients as well as deaths compared to the entire world. On the 14th of March 2020, Spain recorded an increase of nearly 2000 new cases. The day of 16th March 2020, proved to be one of the most critical days for financial markets as Wall Street again faced a downward trend, with the Industrial Average of Dow Jones falling by three thousand points. S&P 500 as well as NASDAQ also dropped around twelve percent. On 18th March, trading halted on Wall Street for the 4th time in about two weeks. The Dow Jones Industrial Average closed bearing a loss of just over 1,300 points and S&P deteriorated by almost 5%. On the same date, Italy reported its worst day with the death rate rising by four hundred and seventy-five, marking the largest one-day hike. On this day, Trump passed the bill related to aid for coronavirus into law. (World Health Organization, 2020) (NBC News, 2020)

On 19th March, the death toll of Spain (2nd most affected country in Europe) observed death toll increase by 209 within 24 hours, making the total quantity of deaths to 767 in addition to confirmed cases to 17,147. On 23rd March 2020 UK issued a 3-week nationwide lockdown with stringent new measures to limit the mobility of people. On 25th March, WHO warned that

the US could end up becoming a worldwide epicenter of coronavirus epidemic, with fifty-four thousand, eight hundred and ten cases including seven hundred and eighty-one deaths. On 26th March, Wall Street rallied for 3rd straight day despite record-breaking unemployment claims in the US. On 31st March, Wall Street concluded one of the horrible quarters in the entire history of the stock market, indicating the disturbing economic impact of the epidemic. On the same day, the government of South Carolina ordered all businesses that were non-essential in the state to shut down. On 2nd April, Spain recorded its deadliest day with 10,000 total fatalities, making it the 2nd country in the world to reach this spike with Italy ranked on 1st having 13,555 deaths. The chief of the European Commission proclaimed that Italy would be the 1st country to collect financial aid from the EU to help during the financial crisis resulting from the pandemic. (World Health Organization, 2020) (NBC News, 2020)

On the 10th of April, Apple and Google announced entering into a partnership to use smartphone technology for tracing the spread of the pandemic. On 11th April, Iran initiated the reopening of government offices and businesses after a nationwide lockdown to combat virus spread. On 14th April, some of the Italian businesses consisting of bookstores, stationery stores as well as children's clothes shops were allowed to open. Pakistan imposed a nationwide strict lockdown from 23rd March 2020 due to a sudden rise in the number of patients. On April 25th, India and Pakistan eased its lockdown restrictions for some of the businesses. Pakistan extended its smart lockdown till May 9th, allowing some of the industrial and commercial tasks to begin under stated safety guidelines. On 14th of May, New York Stock Exchange President Stacey Cunningham publicized that the NYSE will reopen on May 26th, having a subset of brokers who will have to wear face masks to be allowed back onto the trading floor. (World Health Organization, 2020) (NBC News, 2020)

2.2.2 Pakistan (Jan – May 2020)

On the 26th of February, 1st coronavirus case was confirmed in Pakistan with a gradual increase in reported cases. Initially, 2 cases were exposed, 1 from Karachi and others from Islamabad. Meanwhile, this happened, in forty days the affected COVID-19 cases in Pakistan. This forced government of Pakistan to impose a strict lockdown from 23rd March 2020, that lasted till May 2020. (Government of Pakistan, 2020)

In the early days of March, with lower cases in Pakistan, the federal government permitted Shiite pilgrims to arrive from Iran to enter Pakistan via Balochistan province. Not known, the

pilgrims were carriers of this novel coronavirus which drastically multiplied the cases in the country. Not only this, the government further allowed some Sunni believers to accompany Tablighi Jamaat in the congregation within Punjab province, escalating the cases. Facing immense pressure from trade unions as well as religious groups the government of Pakistan had to lift restrictions for the celebration of the Eid festival on May 24th. (DW, 2020)

On 2nd March, one more case of a 45-years old female was identified from Gilgit-Baltistan. The day of 9th March resulted in 16 new cases in Sindh with the highest quantity of cases, thirteen in total. On March 10th, 3 additional cases were confirmed in Balochistan, Quetta, and Hyderabad. Afterward, in many Punjab districts, including Gujranwala, Lahore, Sargodha, Hafizabad, and Lodhran, seventy-six suspected cases were reported. The same day, the 2nd case was notified in Skardu. (TECHNOLOGY, 2020)

On 13th March, the Pakistan Cricket Board (PCB) attempted to offer the international performers to quit Pakistan Super League-V for return to their hometown due to the fear of a coronavirus outbreak. One of the international staff members and 10 other international players agreed to back off from the tournament. On 17th March, the semi-final as well as final of PSL-V were suspended due to the intensification of coronavirus cases in Pakistan. On the same date, all international air travel stopped in Pakistan excluding those booked at Lahore, Karachi, and Islamabad airports. (Government of Pakistan, 2020)

On 15th March, 5 more cases were broadcasted in Karachi, with 1 new case from Islamabad. Lahore Health Secretary confirmed the 1st case in the city. On 16th March, one hundred and thirty-four new confirmed cases got registered, one hundred and sixteen from Sindh, fifteen from KPK, besides the identification of three cases from Balochistan. On the 17th of March, two hundred and thirty-seven new cases rose, twelve within Sindh, four from Islamabad, with 25 in Punjab. Azad Kashmir witnessed its first cast on the day of 18th March. Punjab went under complete lockdown on the 23rd of March, for the entire fourteen days. Previously, the government of Gilgit-Baltistan and Sindh forced the complete shutdown of its provinces for the following fifteen days. (DW, 2020)

On 18th March, all international flights were suspended form 21st March till 4th, April. The Railways Minister declared suspension of 42 trains. On March 19th, China provided aid worth \$4 Million along with 300,000 medical face masks, 10 ventilators, and other types of equipment to Pakistan. (TECHNOLOGY, 2020)

US helped Pakistan by the provision of funds worth \$1 Million as part of the program of US AID against the deadly virus. Also, the Asian Development Bank ensured provision to Pakistan of \$350 Million while \$900 Million were agreed to be supplied in late June. The day

of 22nd March marked another casualty when twenty-six years old Dr. Usama Riaz got infected with coronavirus residing in Gilgit Baltistan. The same day, the government of Balochistan notified 1st death of a patient aged 65 years old, at Quetta's Fatima Jinnah Chest Hospital. (DW, 2020)

On 22nd March, Sindh's provincial government ordered stoppage of operational activities for all kinds of markets, malls as well as restaurants, to help break the increasing trend of virus spread in the province. On 23rd March, Khyber Pakhtunkhwa's authorities suspended public transport within the district for complete seven days. Railways Association of Pakistan publicized halt of entire train service which abridged the number of passengers by thirty percent. By 25th March, the Chinese Tycoon, Jack Ma Foundation, and originator of virtual retail, Ali Baba, supplied five hundred thousand quantity of face masks in addition to fifty thousand units of masks of N-95 as part of the 1st emergency supplies. (Government of Pakistan, 2020)

2.3 Financial Impact Highlights

2.3.1 Worldwide (Jan 20 – May 20)

The COVID-19 virus has undoubtedly triggered an unparalleled human wellbeing disaster. The actions that are vital to containing the disease have triggered a monetary downturn. By now, there lies boundless insecurity regarding its severity as well as length. As per the most recent International Financial Steadiness Report, the economic arrangement has already sensed a dramatic impression, and even more, strengthening of the calamity could disturb world-wide economic constancy.

From the time of the outbreak of this virus, the values of risk-related assets have collapsed abruptly. The risk related assets had to suffer partial or additional declines compared to that in the year 2008 and the year 2009. Many equities related marketplaces in both types of economies large as well as small have endured deterioration of about 30% or greater at the trough. Moreover, credit spreads have jumped, particularly for lower-rated firms. There is an emergence of marks of tension in major short-range funding marketplaces, including the great worldwide market for the US dollar bill. Financial instability has pointed to a greater extent, in some instances to levels last observed during times of global financial crisis due to uncertainty created for the economies as a result of this pandemic. With the existence of this hike in

volatility, market liquidity has worsened meaningfully, even in marketplaces traditionally perceived as profound, such as the market of the US, adding to unexpected asset price arrangements. (IMFBlog, 2020)

To safeguard the constancy of the global economic system as well as back the global economic system, central financial institutions all over the globe have been the first ones at the time of defense. Firstly, they have considerably eased monetarist policy by reducing policy rates in the case of advanced economies to historic lows. Almost half of the central financial institutions in evolving markets plus countries with lesser incomes have also amended policy rates. As a consequence, the effects of percentage reduction will be reinforced via central financial institutions' guidance regarding the future path of budgetary policy and extended asset acquisition programs. (IMFBlog, 2020)

Secondly, the provision of additional liquidity by central banks via open marketplace operations acted as a support. Thirdly, numerous central financial institutions agreed on the enhancement of liquidity position of US dollar provision using arrangements of swap line. By taking a bold step and acting as buyers of the last alternative in these markets to help contain mounting pressures at the cost of credit, the central banks are making certain that all households as well as firms continue to have admittance to credit at a reasonable price. As a result of trying to contain the fallout from the pandemic, investor sentiment has to some extent stabilized. However, strains in some of the markets have subsided and risk asset values have partially recovered from earlier declines. However, the sentiment is still fragile, and global financial conditions are much tighter in comparison to the pre-COVID situation. (THE WORLD BANK, 2020)

A severe tightening of worldwide financial conditions ever since the outbreak of the pandemic along with a dramatic worsening of the economic point of view has shifted one year ahead global growth distribution quite massively to left. Now, about 5% likelihood is observed in regards to global growth falling below -7.4%. For comparison sake, this threshold was previously above 2.6% in October 2019. Due to this financial worsening the most at stake are emerging markets, bearing the heaviest burden. As per IMF reports, developing markets have experienced the sharpest reversal of portfolio flow, of around \$100 Billion or approximately 0.4% of their GDP, giving tough challenges to the most vulnerable countries. (BBC News, 2020)

Economic uncertainty including equity market volatility accelerated sharply within countries all over the globe. Stock markets in top economies consisting of the United States, Europe as well as Japan fell to a greater extent and witnessed a push towards increased volatility

as investors panicked and tried to factor the recent risks speculated due to novel coronavirus outbreak. As a consequence of this increased uncertainty, credit spreads have faced broad widening all over the markets as investors have relocated from risky towards relatively safer assets. The most at stake due to this relocation are emerging and high yielding market bonds. Financial conditions have tightened considerably as a result, meaning that companies are suffering from higher funding costs when trying to enter equity and bond markets. This sudden tightening of financial conditions has ended up dragging the economy as investors delay their investment decision whereas consumers reduce consumption owing to insecurity. (United Nations Industrial Development Organization, 2020)

Expectations of inflation levels going down along with the tightening of financial conditions force central banks to play an active role to save the economy. The financial situation drawn out as a result of the COVID outbreak led to a sharp fall in interest rates along with increased anxious feelings about the economic outlook. This further raised investor concerns regarding the position of banks. Hence, share prices of banks fell sharply and banks had to face pressure over bond prices reflecting lower potential loss. However, this time banks were much more resilient compared to the 2008 financial crisis as they possessed greater liquidity and capital cushions. This concludes that risks to financial stability position emerging from the banking sector are quite lower despite declining share prices. (COVID-19 Business Impact Center , 2020)

2.3.2 Pakistan (Jan 20 – May 20)

The speedy spread of the virus of COVID-19 after the very first case was identified in Pakistan has resulted in economic activity to a complete stop. The deadly COVID-19 sickness was definite to have touched Pakistan on 26th February 2020, once a pupil resident in the city of Karachi was verified positive on his return from Iran. This resulted in the greatest of the country been located under the strict complete shutdown. Shut down of non-essential industries as well as national supply chain disturbances have resulted in a noteworthy impact on communication, storage, transport, trade, retail, and wholesale which is the major sub-sector of the services subdivision. (The World Bank, 2020)

The fall in global as well as the domestic response has also compounded anxieties in the industrial subdivision of Pakistan, which was affected by both supplies as well as demand shocks. Additionally, the country's key industrial segment textiles and clothing were largely visible to disruptions posed by COVID-19 due to its labor-intensity. Typical inflation in the

country inflated to around 12 percent from July to March FY-20 (from approximately 7% in July to March FY-19), reflecting upward adjustments in administrated prices as well as the depreciation of the exchange rate. State Bank of Pakistan successfully maintained a strict monetary position during this era, observing the policy rate of 13.25% to diminish inflationary potentials. Nevertheless, as the COVID-19 disease spread, it condensed the policy rate to eleven percent in March 2020. (Sareen, 2020)

Current Account Deficit of Pakistan lessened to one percent of GDP from July to February FY-20, from around four percent in a similar period in FY-19, due to an eighteen percent decline in imports of goods. This, along with large multilateral payments and advanced foreign investment movements, helped alleviate gross international funds to an estimate of US\$13.2 Billion. Conversely, due to worldwide advancements, foreign financiers have offloaded greater than half of their situation in domestic safeties since February. Consequently, the exchange rate, which remained comparatively stable from June to February FY20, run down by seven percent approximately in March. (COVID-19 Pandemic Response, 2020)

In the primary half of FY20, fiscal shortfall stood at around two percent of GDP, in comparison to around three percent in the initial 6 months of FY-19. The economic adjustment was attained through surges in domestic income collections and lower growth in non-interest recurring expenditures. Nevertheless, the COVID-19 epidemic has put important pressure on expenses whereas revenue collections are predicted to be negatively affected. Added to this, Pakistan's proportion of public debt, at 87.5% of its GDP by the completion of FY19, rose sharply mainly due to a severe decline in economic growth resulting in an increased budget deficit. The total public debt of Pakistan increased by 7.6% in the first nine months of the current fiscal year in comparison to the same period last year, according to Pakistan Economic Survey 2019-20. (Covid-19 and Pakistan, 2020)

While the social and economic disruptions threaten reality, they also boost and make ways towards numerous opportunities. As a result, many companies in different sectors of Pakistan have already transformed their business models, processes, and products. In an attempt to uplift daily wage earners and those seriously affected due to financial loss as a result of complete lockdown, the Government of Pakistan announced an economic relief package of Rs. 1.2 trillion. This was intended to help support businesses that got affected in response to the COVID-19 outbreak. Out of this, a total of Rs. 150 Billion was allotted towards low-income groups, specifically labor while Rs. 280 Billion (\$1.76 Billion) was assigned for the procurement of wheat. (Covid-19 and Pakistan, 2020)

In addition to this, loan interest payments for exporters were deferred temporarily, while a package of around Rs. 100 Billion rupees (\$63 Million) were provided to support small industries and the agriculture sector. Added to this, there was a significant reduction in petroleum prices, with the provision of ease to pay electricity and gas bills in instalments if met certain range criteria. While these measures were appreciated and taken positively by the public but they sounded too easy when it came to how they would be delivered. The scheme had its delivery problems which disappointed the general public to a great deal. (Covid-19 and Pakistan, 2020)

2.4 Initiatives by Government of Pakistan

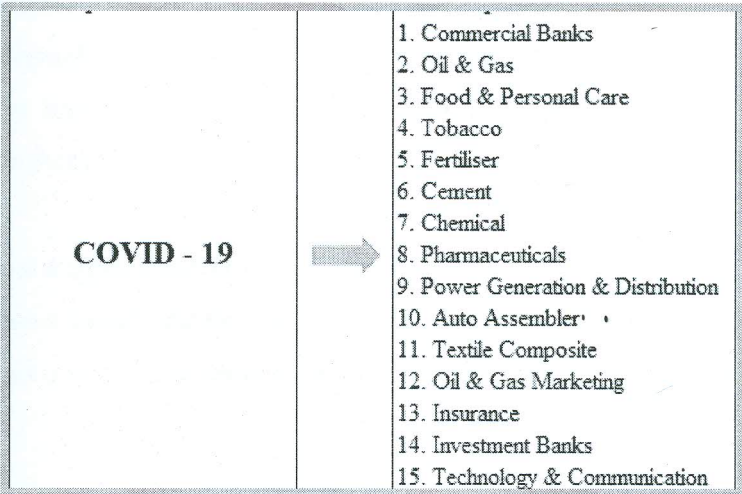
The Government of Pakistan took several initiatives to provide required assistance during the crisis period faced by the entire nation. This was done via the establishment of 2 step strategy in an attempt to respond to the COVID-19 illness. Firstly, the strategy involved the setting of priorities as to what efforts were to be put in place to contain the epidemic. Secondly, it involved the process of mitigation of the spread of the virus as well as to address the effects of socio-economic aspects. The government took several proactive measures aimed at stopping COVID-19 transmission. To track the spread of COVID-19 and provide the required assistance, tiger force was developed by the government, for each country's area to which a large proportion of youth signed up voluntarily in the hope of acting for the wellbeing of the country.

In FY20, the government of Pakistan permitted the first-ever E-commerce policy framework. The expectations are that this approval will add synergy to Pakistan's Kamyab Jawan Programme, One-Woman, One-Bank Account initiative as well as drive of youth employment and empowerment. As a result of this, according to the State Bank of Pakistan (SBP), the GDP of the country can increase by USD 36 Billion along with the creation of 4 Million jobs by 2025 as there will be a rise in the use of digital financial services. This will as per expectations bridge the gap of unemployment and financial loss created due to COVID-19 in the country. On 1st April 2020, Prime Minister Imran Khan went a step further with the launch of the Ehsaas Emergency Cash program to combat economic hardship faced by vulnerable individuals as an outcome of the coronavirus crisis. The support provided under this program was meant to aid in buying rations for poor households so that no Pakistani has to suffer from hunger due to loss of employment. This program covered 12 Million families whereby Rs. 12,000 per family was allotted, making a total budget of Rs. 144 Billion.

Further, the government of Pakistan successfully collected over Rs. 3 Billion for PM’s Corona Relief Fund until May 2020. On the instructions of the prime minister, the government contributed Rs. 4 for every Rs. donated to the fund. The entire process of donation to the relief fund including the release of required funds from the pool was done transparently. The Prime Minister of Pakistan, himself interacted with those affected and calmly listened to their problems, assuring them that their issues would be resolved on priority. On the other hand, Prime Minister instructed that even though industries were allowed to continue their operations, industrialists should implement preventive measures against the virus. Added to this, a cheque of Rs. 20 Million was contributed by the president of FPCCI for the Corona Relief Fund. According to the prime minister, the government took different decisions to keep continuity in the economic activities so that further job losses and financial adversities can be prevented.

2.5 Theoretical Framework

The theoretical framework of this study is based upon stock price which is the best indicator of investigating the progress of a particular company stock since any financial improvement or deterioration is immediately reflected in the company’s stock price. Stock price fluctuation of major stocks within a sector is the most reasonable basis for calculating sectoral indices, which was required for studying the financial impact of COVID-19. The sectors which were selected to weigh the financial bearing of COVID-19 included the following:



2.6 Hypothesis Development

2.5.1: COVID – 19 & Commodity Prices

In the year 2020, a research paper was published by Claudiu Tiberiu ALBULESCU, titled, “*Coronavirus and Oil Price Crash*” in which the relationship between oil price and financial volatility was studied. In addition to this, the research addressed the interaction between oil price and economic policy uncertainty. Data sample from the start of January 2020 till 9th March 2020 was selected, consisting of 49 observations. Oil price data from the US Energy Information Administration (EIA) was collected while financial volatility (VIX) data was obtained from the Chicago Board Options Exchange (CBOE). The author used the ARDL type of methodology to estimate the relationship between oil prices, COVID-19, VIX, and EPU. (ALBULESCU, 2020)

The key findings of this research highlighted that the new coronavirus has generated notable shock waves within financial markets as well as on commodity prices. The study identified that the crash of oil prices depicts that an economic downturn cannot be ignored. The evaluation from ARDL methodology documented a negative and crucial impact of the coronavirus crisis but comparatively small in comparison to the effect of financial volatility as well as economic uncertainty on oil prices. In conclusion, the study reflected, that impact of COVID-19 on oil prices is quite indirect, whereby first impacting the volatility of financial markets. (ALBULESCU, 2020)

The research paper provided certain implications which incorporated the need to have a strong coordinated worldwide reaction comprising economic measures to prevent a severe economic downturn. Even though central banks have already started to cut the interest rates, such a measure should be followed by appropriate fiscal facilities by the government to make the results much more fruitful. (ALBULESCU, 2020)

H1: COVID-19 has a significant impact on the Oil & Gas Sector

H2: COVID-19 has a significant impact on the Oil, Gas & Marketing Sector

H3: COVID-19 has a significant impact on Power Generation & Distribution Sector

2.5.2: COVID – 19 & Financial Stability

In another article, “*Coronavirus: Impact on Stock Prices and Growth Expectations*”, Niels J. Gormsen and Ralph S.J. Koijen provided a perspective on how to interpret movements in the stock market and they explained about growth expectations by combining it with asset pricing data from other markets. Also, they studied how the bound evolves during the crisis in response to news and policy decisions, illustrating how financial markets interpreted events of Wuhan Lockdown, Italy quarantine, and the EU travel ban. Forecast data from January to April 2020 was interpreted using January to April 2020 stock market data. The numbers were based on historical relations between growth and asset prices and included an element of uncertainty. Data were extracted from a range of sources including the S&P 500, the Euro Stoxx 50, US Treasuries (30year maturity), besides, German Bonds (30-year maturity). (Koijen, 2020)

To conduct this study, dividend strip prices were used to analyze an estimate of expected growth over the next year and obtain lower bound by maturity. A lower bound on expected dividend growth by horizon was derived, which can be computed directly using observed prices. Further, the value of the stock market, S_t , was equated to the discounted value of all future dividends. If the stock market fell, then either expected future dividends fell or investors discounted future dividends at a higher rate. (Koijen, 2020)

In its key findings, it laid out that the short-term economic growth consequences are more severe than the consequences after around five years. Besides, the initial decline in the aggregate stock market in the US, with a small response to short-term dividend prices, suggested that modest shocks to short-term expectations can be a reason for large as well as persistent variations in expected excess returns. In the end, it recommended that during periods of economic and financial distress, frequently updating measures of the expected path of the economy should be the key for policymakers. The author also portrayed that dividend futures can constitute a useful tool for policymakers as well as for market participants in this regard. (Koijen, 2020)

In “*Coronavirus and financial volatility: 40 days of fasting and fear*” by Claudiu Tiberiu ALBULESCU, the author research about the effects of official announcements in respect to new COVID-19 cases identify and increase in death toll ratio on financial markets volatility index (VIX) during the first 40 days internationally. Three models have estimated with primes focus on China (Model 1), countries outside China (Model 2), and the overall worldwide situation (Model 3). Daily data were downloaded from websites of WHO and FRED database. The research conducted three main types of analysis. Firstly, the impact of

announcements related to recently infected cases was laid out. Secondly, the influence of estimates in regards to death ratio on financial volatility was illustrated. Lastly, the results of coronavirus impact all over the globe were evaluated. (ALBULESC, 2020)

The conclusion drawn out of this study for model 1 was that newly reported cases of COVID-19 had a marginal negative effect on financial volatility. Model 2 depicted that COVID-19 contributed to an increase in financial volatility. Hence, the markets are more sensitive to the spill over of coronavirus in the US and Europe. Model 3 revealed inconclusive results regarding COVID-19 total newly identified cases on VIX. Also, it was drawn out that the death ratio concerning this novel virus outside China led to higher financial volatility in comparison to ratio reports within China. Inelasticity terms, Model 2 evidenced that rise of a 1% in death ratio generated about an 11% increase in the financial volatility index. In comparison to previous estimations, in cases where no substantial effect was reported, the total death ratio (China & other countries) positively impacted the volatility. (ALBULESC, 2020)

So the highlights for this study evolved around three implications. Firstly, new cases reported outside China only have a positive impact on VIX. Secondly, the death ratio has a significant and positive impact on VIX for all tested models. The effect is stronger for the death ratio outside China. Thirdly, the spread of coronavirus increases financial volatility and that persistence of COVID-19 might generate a new episode of international financial stress. (ALBULESC, 2020)

In an article, *“Development Finance Institutions and the Coronavirus Crisis”*, Stephany Griffith-Jones and Dirk Willem te Velde drew certain important conclusions listing out three major constraints that Development Finance Institutions (DFIs) face for being countercyclical in a crisis. Firstly, they must support private firms in commercial terms and get their funds back. Resultantly, there will be far fewer profitable opportunities during a global recession. Secondly, several investee companies struggle to repay loans and dividends, which most DFIs normally recycle. Thirdly, DFIs have diverse ways of accessing additional resources. Some of them access the capital markets and face additional difficulties, while others enjoy capital increases from governments. (Velde, 2020)

Three recommendations were also provided concerning these difficulties that might be faced by shareholders of DFIs due to the recession created by COVID-19. Firstly, the shareholders can redirect 2% of \$5 trillion stimulus packages which G20 countries already announced to assist firms beyond G20 countries. Secondly, loosen up credit criteria to allow DFIs to take on more risk. Lastly, elevate their contribution, as part of their broader new funding initiatives. (Velde, 2020)

In another research paper, "*Financial markets under the global pandemic of COVID-19*", published by Dayong Zhang, Min Hu, Qiang Ji in 2020, general patterns of country-specific risks and systemic risks in the global financial markets was mapped out. It also analyzed the potential consequences of policy interventions, such as the US' decision to implement a zero percent interest rate along with unlimited quantitative easing (QE), and to what extent these policies may introduce further uncertainties into global financial markets. Daily stock price data from the start of January 2020 up to 27th March 2020 was taken as a sample of the study. The indexes for all stock markets across the world were obtained from investing.com. Whereas, data on global coronavirus infections was gained from John Hopkins Coronavirus Resource Center. (DayongZhang, 2020)

To perform this analysis, volatility analysis (VA), correlation analysis (CA), and minimum spanning tree (MST) were used as a methodology of the study. Through VA, it was found out that the pandemic has led to greater risk and uncertainty in the global financial markets. CA emphasized that the correlations in February were relatively low, but they increased substantially upon entering the month of March. The highest level appeared in the week ended 6th March 2020 when Europe and the US started to lose control, prompting the WHO to announce a pandemic during the weekend. MST concluded that regional market integration or collaboration is likely to appear in the face of this major crisis. (DayongZhang, 2020)

Also, it highlighted the fact that the US stock market, both in situations of pre and post-pandemic crisis failed to take a leading role in the world. Added to this, the study reflected how the great uncertainty posed by this pandemic and its associated economic losses has caused markets to become highly volatile and unpredictable. Policy reactions to contain the virus and level the stock markets are much needed. But, non-conventional policy interventions such as US' unlimited QE, create further uncertainty and may cause long-term problems. Additionally, it was observed that there was no collaboration amongst countries around the world to cope with this global crisis, as markets in the country group studied responded differently to national-level policies as well as the general development of pandemic. Ultimately, this tendency towards disintegration in the global community is more severe of a threat than the virus. (DayongZhang, 2020)

In the research paper, "*The Coronavirus Debt Threat*", Carmen M. Reinhart and Kenneth Rogoff concluded that heterodox solutions to unsustainable debt, including debt forgiveness and restructuring, have been widely practiced by both advanced and developing

economies over the past two centuries. In this crisis, however, the worst-hit households, companies, and governments need an outright moratorium. (Rogoff, 2020)

In “*Regulating in Pandemic: EVALUATING ECONOMIC AND FINANCIAL POLICY RESPONSES TO THE CORONAVIRUS CRISIS*”, Hiba Hafiz, Shu-Yi Oei, Diane Ring & Natalya Shnitser discussed the ramifications and identified three interrelated but conflicting policies at stake in managing the economic and financial fallout of the COVID-19 crisis. At first, the provision of social insurance as well as a social safety net to individuals and needy families. Secondly, management of systematic financial and economic risk. Thirdly, encouragement of critical behaviors to aid the prevention of COVID-19 spread. The convergence of these three policy considerations and the potential clashes among these has made the outbreak of this virus a significant and unique regulatory challenge for policymakers, and one for which the consequences of getting it wrong are dire. (Hiba Hafiz, 2020)

In the working paper, “*The Uncertainty Channel of the Coronavirus*”, Sylvain Leduc and Zheng Liu focused on the economic impact of COVID-19 by analyzing its effects on uncertainty. They considered the U.S. economy’s performance following past events that triggered outsized and sudden changes in the fear index. To carry out this evaluation, monthly U.S. series from January 1986 till January 2020 was accumulated. In this economic paper, three macro time series were included in the statistical model consisting of the unemployment rate, inflation rate measured by year-over-year changes in the consumer price index, along with yield rate on the three-month Treasury bill. The findings summarised that decline in consumer spending reduces aggregate demand, rising unemployment in addition to pushing inflation downwards. The interest rate studied in the paper showed a falling trend reflecting monetary policy easing in response to the uncertainty shock. COVID-19 has had important demand-side effects other than certain supply-side effects including supply chain disruptions and labor shortages. (Liu, 2020)

This working paper suggested that in addition to the tragic human toll, the COVID-19 pandemic would severely reduce economic activity as well since nonessential retail and other business activity is curtailed with social distancing policies forcing people to stay at home. A negative impact on the economy might further amplify and get prolonged by rising uncertainty. Estimates drawn out in this letter suggested that spikes in uncertainty due to novel coronavirus will contribute towards a protracted increase in unemployment, with a significant decline in the inflation rate in the US. It also emphasized that policy responses towards supply-side effects usually involve a trade-off since supply disruptions push up inflation and unemployment. On the other hand, monetary policy can offset the impact of the decline in aggregate demand by

cutting down interest rates which aid in reducing unemployment, simultaneously giving rise to inflation. The study suggested that the negative impact on the economy can be accelerated and stretched by increased uncertainty. The estimates provided in the letter proposed that spikes in uncertainty due to the COVID-19 pandemic will add to a protracted rise in unemployment and a vital decline in the inflation rate in the US. (Liu, 2020)

In the research paper, *“Financial Markets and News about the Coronavirus”*, Harry Mamaysky researched on how financial markets interact with news about the coronavirus pandemic of 2020. Daily price data was collected on SP500 Index, VIX index, FTSE US High-Yield Market (HY) index, and US 2 and 10-year treasury yields from the site of Bloomberg. Data on globally confirmed coronavirus cases was obtained from the Johns Hopkins Coronavirus Resource Center. Contemporaneous relationship analysis was used which considered how daily differences in SP500, VIX, HY indexes, and in 2- and 10-yr Treasury yields interact with the flow of news. The key findings of this study concluded that the reaction of prices to lagged news may be caused by capacity-constrained investors who are incapable of responding to all contemporary news flow, due to its sheer volume. According to Samuelson’s dictum, aggregate market prices are less efficient than individual stock prices in integrating all relevant news, and this may be another dimension of how markets and news interact during crisis times. (Mamaysky, 2020)

In the article, *“The Coronavirus and Financial Stability”*, Boot, Arnoud W. A., et al. researched how to deal with the financial crisis occurring in the economy due to coronavirus. The authors of this study suggested taking joint action on the fiscal side and allowing monetary policy to take a more constrained role. Rapid and focused provision of liquid funds is needed for those firms that have faced a halt in production or their supply chain process as well to those that have faced a large decline in demand. (Boot, 2020)

In the research paper, *“Implications of the Coronavirus on Sales Tax Revenue and Local Government Fiscal Health”*, Bruce D. McDonald, III Sarah E. Larson researched on an exploration of a shock to sales and use tax revenue & impact on county fiscal health. The data was collected for 2008 - 2019 (for 92/100 counties within a state) from the North Carolina Department of State Treasurer. County financial data was matched with population data from the North Carolina State Demographer’s Office for every county in each year. Financial data for fiscal years 2020 and 2021 was forecasted and adjusted the values by a growth rate of 4.5%. Target date of March 1, 2020, for impact, selected and simulations conducted. Based on these simulations, counties in North Carolina will face increasing fiscal stress due to the effect of the COVID-19 outbreak. (Bruce D. McDonald, 2020)

The size of the impact varies based on how much revenue is lost. Anecdotally, many local governments in North Carolina have estimated that the best-case scenario is a 20 to 25% decline in sales tax revenue for the remainder of the fiscal year. The worst-case scenario was estimated to be 50% loss. (Bruce D. McDonald, 2020)

The findings of this analysis showed that any impact of COVID-19 on sales and use of tax revenue collections for counties in North Carolina has a very real impact on the fiscal health of counties within the state. With the more extreme reduction of 50% in sales and use tax revenue, the average county in North Carolina will lose over \$8 Million. If the outbreak extends into the fiscal year 2021, a reduction of sales tax revenue of 25% results in 40 out of the 92 counties included in the study running a deficit per capita. The results of this analysis also pointed to a pre-existing problem in local governments. (Bruce D. McDonald, 2020)

In a research study titled, "*Impact of Recession on Middle-Class Investor in India: In View of Coronavirus Pandemic*", Dr. Megha Mehta analyzed the effect of the recession on middle-class investor because of the COVID-19 pandemic. The main objectives were, to identify the investment behaviour and avenues of investment of the middle class, to find out the purpose of investment of the middle-class investor, to analyze the impact of COVID 19 and recession on the middle-class population, and to determine alternative investment opportunities due to recession. (Mehta, 2020)

Data were collected from 30 respondents, applying telephonic interview and WhatsApp tools in the lockdown period. Secondary data from journals, internet, textbooks, etc was collected as well. Simple random sampling was used with an exploratory research method. Due to soaring rates of gold and diminishing trends in the share market people didn't want to invest in gold, and shares & bonds. A moderate investment in real estate and mutual funds was observed because of pre-existing commitments. Respondents highly preferred to invest in fixed deposit, insurance, and govt. saving schemes as they were safe and secure. Fixed deposits and insurance were highly preferred by all age groups and professionals, businessmen, and practitioners. White real estate, gold, and shares & bonds were least preferred amongst all age groups. Salaried persons had faith in govt. saving schemes also. mutual funds were highly liked by businessmen. (Mehta, 2020)

During the pandemic period and resulting recession, middle-class investors were quite averse towards investment because of already committed responsibilities. Further, the author observed that India's middle class was more optimistic, confident, and globalized even during the crisis period. Thus, from the analysis conducted it was found that middle-class investors highly wanted to invest in fixed deposits and insurance and very less in gold, real estate, and

shares & bonds. They wanted to keep cash & cash equivalents as an alternative for contingencies. (Mehta, 2020)

H4: COVID-19 has a significant impact on the Investment Banks Sector

H5: COVID-19 has a significant impact on the Insurance Sector

H6: COVID-19 has a significant impact on Commercial Banks Sector

2.5.3: COVID – 19 & Business Operations

In the research paper, “*Breakdown of Business and Workers in India: Impact of Corona Virus*”, Himanshu Koshle¹, Rabab Kaur², and Ruchi Basista analyzed the situation of the Indian market i.e. to what extent Coronavirus has spread in the world and what type of effect it had on businesses of India. A total of 10 articles were downloaded from the internet and read in-depth and drawn the conclusion according to the objectives of the study to evaluate the impact on all industries of India. The conclusion drawn was that Coronavirus had a serious impact on major sectors incorporation tourism industry, air travel, health care, as well as the trade that suffered the principal brunt of the strict activity curb related to travel, assembling, etc. by authorities across the globe, followed by a broader impact on other divisions as the economic movement was halted. (Himanshu Koshle, 2020)

H7: COVID-19 has a significant impact on the Tobacco Sector

H8: COVID-19 has a significant impact on Fertiliser Sector

H9: COVID-19 has a significant impact on the Chemical Sector

H10: COVID-19 has a significant impact on the Pharmaceuticals Sector

H11: COVID-19 has a significant impact on Auto Assembler Sector

H12: COVID-19 has a significant impact on Textile Composite Sector

H13: COVID-19 has a significant impact on Technology & Communication Sector

H14: COVID-19 has a significant impact on the Cement Sector

H15: COVID-19 has a significant impact on Food & Personal Care Sector

CHAPTER 3

3. RESEARCH METHODOLOGY

3.1 Data Collection

Over the years, researchers have used weekly or monthly data to study the impact of price-sensitive information related to stock prices. However, weekly or monthly data fails to depict the exact time of adjustment of stock prices as a result of new information. Therefore, to fulfil the need for precise evidence, in this research work daily adjusted closing stock prices were used to compute returns for thorough analysis.

To study the impact of Coronavirus, a detailed data sample was selected whereby stock prices were used to provide a basis for the calculation of Pakistan's sectoral indices. The impact on these sectoral indices was studied to get an idea as to which sector got affected the most.

Daily data of 10 stocks for each of the top 15 sectors from the Pakistan Stock Exchange (PSX) was downloaded for Pakistan. These fifteen sectors from the PSX website were selected out of a total of 36 sectors listed on PSX, based on the highest market capitalization. Stock selection under each sector was based on the highest number of shares, as listed on the website of KSE Stocks. In the case where stocks were less than 10 for any sector, all of them were included in the sample. For stocks where prices for some of the days were missing, the average of the previous 3 days was taken to have an equal sample for analysis.

3.2 Sample Size

Data collection exercise was divided into two periods i.e. Pre-COVID-19 (1st January 2019 – 25th February 2020) and Post-COVID-19 (26th February 2020 – 31st May 2020) for better understanding of the financial impact of COVID-19 on Pakistan's sectors, separating any other economic repercussions that may have affected the sectoral indices. Stock prices data was obtained from Investing.com for all stocks under each of the 15 sectors.

3.3 Methodology

Equally weighted sectoral indices calculated for each of the 15 sectors of Pakistan due to the unavailability of sectoral indices using log returns formula:

i.e. $Ln (\text{Current stock price} / \text{Previous stock price})$

For pre-COVID-19 period data from 1st January 2019 to 25th February 2020 was selected while for post-COVID-19 data from 26th February 2020 to 31st May 2020 was selected. This study followed the method of event study methodology which was applied to the calculated sectoral indices of Pakistan (average returns for each day for each stock) to analyze return volatility for each of the sectors. To perform this type of methodology abnormal returns were calculated using mean, beta, slope, intercept, and standard deviation for each of the sectors. For the Pakistan case, the critical date was 26th February 2020, i.e. the day first COVID-19 case appeared in Pakistan.

Further, to gain a thorough understanding of market risk volatility due to COVID-19 on the economy of Pakistan ARCH model was applied using EVIEWS software. The ARCH /GARCH procedure is commonly used to model risk related to time-variation. Therefore, as an alternative to identifying the reasons that explain time-varying risk, its aftereffects can be used to model with the ARCH/GARCH method. The basic model of ARCH(q) has 2 main equations, including the mean equation as well as a variance equation. Equally these equations must be assessed at the same time as the variance is calculated as a function of the mean. The simpler form of ARCH (1) with AR (autoregressive) 1st order mean equation along with 1st order variance equation was used, where GARCH (0) was considered. In a very rare occurrence, where the probability for the coefficient of the mean equation was less than 0.05, GARCH (1) was considered with ARCH (1). Results obtained i.e. coefficient and probability for both mean and variance equation for each of the stocks during pre-COVID-19 and post-COVID-19 were recorded for analysis. Also, the ARCH – LM Test was applied on two sets of sample data, and the resulting F-Stat and probability were recorded for each of the stock under all selected sectors of Pakistan.

CHAPTER 4

4 FINDINGS & ANALYSIS

Application of Abnormal Returns & ARCH Model (See Appendices)

The study conducted showed a negative trend of the overall financial market of Pakistan after the first wave of deadly coronavirus hit the country. The market index of KSE 100 had to suffer negative average mean returns in the post-COVID-19 scenario compared to the pre-COVID-19 position (decrease of about 1224% i.e. from 0.0002 to -0.0022).

In order to answer research questions and test designed hypothesis, abnormal returns and ARCH model was applied to sample data. Both types of methodologies used together helped to get a clear picture as to how each of the sectors performed in terms of return and risk volatility. In case of abnormal returns application, average mean for each of the sectors was evaluated while use of ARCH model involved calculation of percentage change in summation of ARCH and GARCH coefficients which provided a good comparison of pre-COVID-19 and post-COVID-19 situation.

4.1 Results of Testing Main Hypothesis

Accepted below hypothesis:

H1: COVID-19 has a significant impact on the Oil & Gas Sector

H2: COVID-19 has a significant impact on the Oil, Gas & Marketing Sector

H3: COVID-19 has a significant impact on Power Generation & Distribution Sector

<i>Results Obtained</i>		H1'	H2	H3
		<i>Oil & Gas</i>	<i>Oil, Gas & Marketing</i>	<i>Power Generation & Distribution</i>
<i>Abnormal Returns</i>	<i>% Chg in Mean Avg Return</i>	-1132%	-62%	-176%
<i>ARCH Model</i>	<i>% Change in Risk Volatility</i>	33%	5%	22%

Ban on all kinds of business operations did not just affect one sector but had serious impacts on many vital sectors of the country as each of the sector plays an imperative role in some way or another. When the industries and markets were completely shut down by the government, the sector of Power, Generation & Distribution was not able to remain immune from the effects of Coronavirus as well. This along with the government's efforts of trying to offer relief to its citizens in an attempt to save the population from dying of hunger as no household was left unaffected from this unexpected financial crisis. The relief to offer reduced rates for electricity and gas to each of the households further put a dent onto the returns of the companies supplying the utilities.

Accepted below hypothesis:

H4: COVID-19 has a significant impact on the Investment Banks Sector

H5: COVID-19 has a significant impact on the Insurance Sector

H6: COVID-19 has a significant impact on Commercial Banks Sector

<i>Results Obtained</i>		H4	H5	H6
		<i>Investment Banks</i>	<i>Insurance</i>	<i>Commercial Banks</i>
<i>Abnormal Returns</i>	<i>% Chg in Mean Avg Return</i>	-46%	-46%	-1821%
<i>ARCH Model</i>	<i>% Change in Risk Volatility</i>	59%	59%	32%

Investment Banks undoubtedly encountered a negative financial scenario with negative average returns. This was perhaps due to the speculation of lower returns on investments due to uncertainty created in the environment. Also, many investors preferred to keep cash readily available to be used in case of an unforeseen circumstance, e.g. emergency hospitalization of the family member(s) or loss of all income sources as the economy was experiencing a negative spiral.

The most volatility according to the calculation of percentage change was for the sector of Investment Banks i.e. 59% increase (from 0.5211 to 0.8269). This was perhaps because the magnitude of the decline in the economic growth of Pakistan due to this pandemic became uncertain with many businesses and individuals incurring significant unexpected losses. Due to the unavailability of vaccines and a drastic increase in the number of patients and death toll in the country the economy of Pakistan painted a dismal picture for its citizens. The trust in

future investments was hard to build provided the bleak future scenario as the economy seemed to gradually move towards recession.

Commercial Banks appear to have suffered the most amongst all sectors selected in the sample for study with about 1821% decrease in its average mean returns. Considering the market, the returns deteriorated by about 2856%, turning from positive to negative figures after the COVID-19 entered the country. Even though the commercial banks performed unfavourably due to the panic created in the economy which curbed the consumer spending as everyone wanted to save up in case of an emergency, it did still manage to perform well keeping in view the level of risk the economy was facing. This is evidenced through improvement in the relative percentage of risk-adjusted return which accelerated by about 2272%. This was perhaps due to the government efforts of offering SBP relief packages to struggling businesses that reverted by increased borrowing as well as a reduction in interest rate to as below as approximately 7% from the range of 13%.

Accepted below hypothesis:

H7: COVID-19 has a significant impact on the Tobacco Sector

H8: COVID-19 has a significant impact on Fertiliser Sector

H9: COVID-19 has a significant impact on the Chemical Sector

<i>Results Obtained</i>		H7	H8	H9
		<i>Tobacco</i>	<i>Fertiliser</i>	<i>Chemical</i>
<i>Abnormal Returns</i>	<i>% Chg in Mean Avg Return</i>	-208%	146%	164%
<i>ARCH Model</i>	<i>% Change in Risk Volatility</i>	33%	16%	22%

The tobacco industry is one of the top contributors to revenue generation in the country of Pakistan despite the health hazards it entails. While this sector suffered negative average returns and adverse market-adjusted returns as well, it still somewhat did better in the case of risk-adjusted returns. This is perhaps because for smoking addicts, tobacco products act as a necessity and even though Coronavirus affects the most with those possessing weak lungs, many Pakistani addicts were reluctant to give up on their smoking habits. The reluctance in the change of behaviour was no doubt addiction and also because Pakistan’s major population comprises of illiterate individuals who were not ready to believe the outbreak of this pandemic

to be true for a much longer period. So in comparison to the risk portrayed by the market to this industry, the industry still fairly performed better.

Commercial Banks, Oil & Gas, and Tobacco were the next in the line for which change in coefficient percentage was worth taking a look at. The change for Commercial Banks, Oil & Gas, Tobacco as well as Textile Composite was below 50%, with only Investment Banks experiencing a larger shift in its coefficient figures after the COVID-19 hit the country. A threshold of up to 10% was used to evaluate the probabilities of the LM test which depicted that all ARCH effects have been modelled in both pre-COVID-19 and post-COVID-19 situations.

Due to the need to maintain social distancing and prioritize hygiene, many consumers reacted by boycotting basic agricultural food items for the fear of catching the virus. The agriculture sector of Pakistan is the most important sector for the country as it directly supports the population and accounts for about 26% of Gross Domestic Product (GDP). When demand for this sector was reduced, this impacted the demand for fertilizers which is one of the main input sources for crops. However, the sector still managed to generate positive average returns since the government stepped in and offered a relief package to support poor farmers. The government of Pakistan approved an agriculture relief package of Rs. 56.6 Billion for farmers providing them subsidy on fertilizers, cottonseed, and pesticides along with sales tax relief on locally manufactured tractors amid the coronavirus pandemic.

The Chemical sector of Pakistan immensely suffered as the Coronavirus spread its wings in the country. The restrictions imposed on the transportation and trade by China to prevent the spread of the virus had hurt the industry as the neighbouring country was the main source of imports into Pakistan for raw materials utilized to manufacture numerous organic and miscellaneous chemical products. Not only this but due to shut down of operations of many important manufacturing industries of Pakistan, which depend on chemical industries for their products has further aggravated the losses for the chemical sector of Pakistan. Interestingly, the results obtained while studying the average returns for this sector, a positive trend was observed when pre-COVID-19 and the post-COVID-19 situation was compared. This was perhaps because the sector was already suffering economic losses in the pre-COVID situation due to negative business outlook since the establishment of PTI government. The sector must have improved slightly compared to last year also because many new small scale businesses stepped in in search of new business opportunities as a result of losing original jobs or demand for old businesses. These new businesses may be dependent on chemical products manufactured in the country. Also, many laboratories of Pakistan and abroad initiated research on an antidote for

this new virus. This can be one of the reasons why this sector still appears to have somewhat positive standing. The chemicals produced might be getting exported or supplied domestically to complete vaccine research.

Accepted below hypothesis:

- H10: COVID-19 has a significant impact on the Pharmaceuticals Sector
- H11: COVID-19 has a significant impact on Auto Assembler Sector
- H12: COVID-19 has a significant impact on Textile Composite Sector

<i>Results Obtained</i>		H10	H11	H12
		<i>Pharmaceuticals</i>	<i>Auto Assembler</i>	<i>Textile Composite</i>
<i>Abnormal Returns</i>	<i>% Chg in Mean Avg Return</i>	2364%	41%	-1026%
<i>ARCH Model</i>	<i>% Change in Risk Volatility</i>	6%	21%	37%

In these times of catastrophes, probably the only sector that was able to maintain and prosper was the Pharmaceuticals sector. The average mean returns increased by as big as 2364% in the post-COVID-19 situation in comparison to the pre-COVID-19 scenario. with the rapid increase in the number of patients and the sudden rise in medicinal products, machinery, and especially ventilators, the pharmaceutical sector was forced to act rapidly to save precious lives. Also, during a sudden hike in the demand for medical supplies as well as protective gear, demand for polypropylene fiber enlarged, which is the main raw material for chemical goods used for treatment purposes. The rise in medicinal products drove the chemical industry but due to completely shut down this was the only sector driving the chemical industry. Otherwise, in normal circumstances, the chemical industry provides its products to numerous other sectors.

Another major, progressive, and profitable sector for the country of Pakistan is that of Textile Composite. Demand for this sector is endless as the Pakistanis are very enthusiastic about their appearances and are always on the look to follow all kinds of latest fashion trends all the time. Every year many new clothing brands emerge in the country to meet the rising demands. However, this sector had to taste the repercussions of COVID-19 as well. The systematic risk for Textile Composite increased by around 38% (measured by Beta) as all brand outlets, malls, and shopping markets in Pakistan were shut down and people avoided buying clothes online for the fear of catching the virus upon delivery. Also, in Pakistan online buying is still accompanied by trust issues as people are reluctant to spend their hard-earned money on

products they cannot physically see and touch right before the money is paid. Where the market risk in this sector rose, mean average returns and risk-adjusted returns fell (turning from negative to positive absolute figures), the sector still performed somewhat better compared to the market situation. This is perhaps due to brand loyalty that some of the well-established and leading clothing brands enjoyed to which customers happily chose to buy from even by placing online orders.

Also, due to the sudden shutdown, many new entrants entered the online platform giving strong competition to few online clothing sellers in Pakistan's market enjoying the margins. Where entry of new online sellers increased the competition, resulting in more risk in the sector the buyers were provided with more options to buy from which decreased the margins previously established online seller enjoyed. The sector however still suffered a decrease in its mean comparison of 1026% as many households transformed their spending structure, by focusing mainly on necessities rather than a luxury.

The next sector to have experienced the 2nd highest percentage increase in its volatility is that of Textile Composite. The demand for most wanted designer clothes and even affordable clothing sold in legendary markets of Pakistan sunk overnight as the news of the first COVID-19 case was announced in the country. This accompanied by immediate lockdown by the government scared the population as a whole who reacted by bulk-buying grocery items and aggressive cuts on luxury and entertainment shopping. Where clothing is a necessity item, the fact that Textile Composite contributes such a large percentage of revenues to the country is because the Pakistanis spend on clothing to enjoy different styles and fashion trends. All of these were completely avoided when people spent largely on storing food groceries rather than focusing on their appearances. Further, shut down malls, shopping plazas, and markets by the government increased the level of earning risk overnight for this sector of the economy.

However, with the cases increasing, and the need to protect against the spread of the virus, the demand for surgical masks and protective equipment rose drastically. Upon finding an opportunity, many selling mafias reacted by selling these basic items at unreasonably higher prices to make short-term huge gains. Many brands and other clothing providers jumped into the market of supplying masks made out of clothing with matching colors and beautifully patterned fabric to enjoy the untapped market expected to increase further for a specified time until the vaccine was expected. All of these factors involving sudden entrance and exit into this sector during the tenure of COVID-19 are the reason for such high volatility in the textile sector of Pakistan.

Accepted below hypothesis:

H13: COVID-19 has a significant impact on Technology & Communication Sector

H14: COVID-19 has a significant impact on the Cement Sector

H15: COVID-19 has a significant impact on Food & Personal Care Sector

<i>Results Obtained</i>		H13	H14	H15
		<i>Technology & Communication</i>	<i>Cement</i>	<i>Food & Personal Care</i>
<i>Abnormal Returns</i>	<i>% Chg in Mean Avg Return</i>	437%	395%	88%
<i>ARCH Model</i>	<i>% Change in Risk Volatility</i>	27%	16%	-9%

The technology and communication sector of Pakistan also witnessed a growing trend in volatility figure when pre-COVID-19 and post-COVID-19 were compared. The volatility measured through the ARCH model was estimated to be around 27% increased. This was perhaps of the new issues that were hidden till now and came to the exposure once the use of technology became a necessity in Pakistan. All of the educational institutions directed its staff and students to revert to online modes of communication since the institutions were shut down amid an outbreak of coronavirus. Many areas of Pakistan did not have internet facilities and even the ones that had faced network issues when a larger population shifted to the online platform.

In terms of losses suffered due to COVID-19, the Cement industry was no exception. Out of about twenty-five plants across the nation, eleven plants were completely shut down and the remaining fourteen plants were in half-done shutdown phase when the virus hit the country. Countrywide sales per day earned domestically dropped from approximately one hundred and sixty thousand tons per day to as below as thirty-five thousand tons per day. This is worth a defeat of as big as 8.6 Million American dollars every day. This was amongst the top hit sector as strict lockdown put a sudden stop to all construction activities.

The investors were also not willing to invest in any opportunities for the fear of property value decreasing remarkably due to the expected financial crisis. Several tenants who lost their jobs, we're unable to provide rent to their landlords, many of whom depended solely on this source of income for living. In an attempt to have ample liquidity in case of perceived emergency many individuals reacted in panic house selling to have immediate cash available before the economy suffered its worst peak. All of these factors further put pressure on the loss

of demand for construction activities which ultimately reduced the demand for cement. Since the construction sector of Pakistan is responsible for creating several jobs for the country, the government stepped in and provided a special relief package to the industry to save related industries such as the cement industry from getting adversely affected and in turn provide opportunities to many households at risk of losing daily wages. This is perhaps why despite the negative aftermaths of Coronavirus faced by the cement industry, the sector managed to generate positive average returns.

With the modern era influencing the new generation, interest for branded and expensive makeup collection amongst young females of Pakistan is increasing day by day. This includes the urge towards buying expensive personal care products that aid in enhancing the beauty these days. With COVID-19 the priorities of many individuals changed. Industries involved in the production and distribution of personal care products had to face the circumstances when many females chose to let go of their passion to look perfect and instead saved up for rainy days that were expected due to the sudden rise in infected patients in the country.

Added to this, many restaurants were shut down since dining would have increased the chances of the spread of the virus. Only home delivery was allowed and that too with strict Standards Operating Procedures (SOPs) which most of the food service providers could not adhere to. This was depicted in the abnormal results obtained while conducting the study, whereby average returns for the food & personal care sector went downhill. The beta calculated for the sector also reduced by about 15%, reducing the systematic risk which highlighted the exit of many sellers who could not bear the sudden loss of demand and were unable to keep up with the new practice of following SOPs.

The food & Personal Care sector, on the other hand, witnessed a negative increase in its coefficient figures when modelled through ARCH and GARCH. This indicates a reduction in risk volatility in the industry sector. This might be because this sector is responsible for the provision of products that are a necessity for human survival. Hence, the government stepped in and ensured the smooth movement of food-related items in addition to allowing factories to remain open and continue its operation to keep up with the demand. This was undertaken to assist the population of Pakistan so that there were no shortages of food supplies. Also, it helped to keep these kinds of businesses afloat supporting the economy of the country as well while other sectors faced complete shutdown.

4.2 Analysis of Research Questions

	<i>Financial impact on Pakistan</i>	<i>Worse</i>	<i>Better</i>	<i>Best</i>
	RQ 1	RQ 2	RQ 3	RQ 4
Abnormal Returns	Significantly Negative	Commercial Banks, Oil & Gas, Textile Composite	Technology & Communication, Cement, Chemical, Fertiliser, Food & Personal Care	Pharmaceuticals
<i>% Change in Mean Avg Return</i>	-1224%	-1000% to -1900%	+80% to +500%	+2364%
ARCH Model	Fairly Risky	Investment Banks	Chemical	Food & Personal Care
<i>% Change in Risk Volatility</i>	+5%	+59%	+22%	-9%

Commercial Banks, Oil & Gas, Oil & Gas Marketing, Power Generation & Distribution, Textile Composite as well as Investment Banks sectors all suffered negative average mean returns coupled with an increase in its Standard Deviation which measures the total risk i.e. systematic and unsystematic risk underlying the industry. Out of these six sectors, only for Oil & Gas, Power Generation & Distribution, and Textile Composite, the Beta figures also increased illustrating the rise in the systematic risk. The augmentation in Beta figures is quite alarming as systematic risk cannot be diversified which affects the entire market, making it unpredictable and impossible to avoid entirely. The main factors that contributed towards the financial worsening of these sectors are mainly the panic created in the country, followed by a sudden halt of businesses, private and public routine tasks affecting all of the sectors at once. Strict preventive measures announced by the government had a grave impact on all of these sectors. For instance, gallons of fuel were left unused due to a ban on all kinds of travel incorporating, both domestic and international along with industry operations that drive the Oil & Gas sector.

CHAPTER 5

5 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The comprehensive spread of the coronavirus 2019 will be remembered as one of the most tragic events in history for the entire world. The quantification of how far stretched this economic dilemma resulted is difficult to measure, resulting in substantial uncertainty for the financial outlook plus the related downside risks. Such an abrupt rise in improbability in every aspect of the economy had put both economic development and financial constancy at risk. As firms became more worried and rates of non-payment climbed higher, markets providing credit facility halted suddenly, especially in risky divisions such as high yielding loans, in addition to private-owned debt markets. Such kind of markets has expanded swiftly since the international economic crisis, attaining almost \$9 trillion worldwide, whereas borrowers' underwriting standards, quality of credit, as well as investor protections have deteriorated. High-yield spreads have hit the roof since the inception of March notwithstanding recent declines, predominantly in the sectors most affected by the pandemic similar to air travel and energy.

Correspondingly, loan prices have dropped severely, approximately half of that witnessed during the worldwide financial crisis in previous decades. As a consequence, rating agencies acted by revising their forecasts for defaults upwards to depression levels, as well as defaults implied by the market have also climbed to a greater extent. Banks possess additional capital as well as liquidity in this day and age than in the past, plus they suffered stress tests as well as greater managerial examination in current years, knocking them in a better place than at the inception of the worldwide economic crisis. Likewise, the considerable and synchronized action by fundamental banks to deliver liquidness to banks in numerous economies had assisted to alleviate possible liquidity worries. However, the elasticity of banks might be tested during a sharp stoppage in the country's monetary activity that might result in more severe and drawn-out than currently expected.

Indeed, the enormous declines in bank equity values since mid of January suggested that financiers are concerned about profit capacity and prospects surrounding the

banking sector. For instance, procedures of bank capitalization established on the market prices are at present worse as compared to the position of the 2008 universal financial catastrophe faced by numerous countries. The apprehension is that banks as well as other commercial mediators may perform the role of an amplifier in case the crisis ends up getting deepened further. Necessity is indeed the mother of invention, and the response towards COVID-19 using the digital tools has not been short of an invention. The social as well as economic disruptions while intimidating the reality and developing an air of panic and uncertainty also brings significant opportunities. In response, companies in multiple sectors have already transformed their products, processes, and business models to benefit from new online opportunities. This is because the terror of the spread of the pandemic and the need to maintain physical distance, commonly known as social distance has shifted a larger population of the customers to online stores. Many small scale enterprises reacted by cutting down on extra overheads by trimming down their warehouse expenses for example and evacuating showrooms and displays.

Also, many companies, even those considered to be Large Scale Manufacturing (LSM) responded to this crisis by laying off a big proportion of its staff to secure its margins by trimming down its costs due to lower demand and business shutdowns in the country. Many businesses especially textile had to suffer immense losses and some struggling organizations had to shut down its operations permanently due to unexpected negative demand trending in the entire country along with a ban on exports. Those organizations that managed to transform their business model to suit online shopping by accepting the emergence of e-commerce secured its position and is likely to end up having a brighter future due to an instant rise in the online presence of customers all over the country. COVID-19 has indeed defined a new era for the entire world whereby a new type of competition is in place i.e. to have the best technological advancement. Many educational institutions are now working towards the establishment of advanced learning management systems to accommodate its students in case of a complete shutdown of institutions. The world has realized that there is no other way out than to go online and transform its operations accordingly if it is to survive and prosper. Many multinational companies are now developing online website portals since they fear the customers would not walk into their stores anymore.

5.2 Recommendations

The international outburst of COVID-19 would entail the obligation of harsher as well as longer-lasting restraint measures plus activities that would lead to an additional tightening of universal financial circumstances if they lead to severe as well as a prolonged downturn. This kind of tightening measure would may, in turn, expose the financial susceptibilities that have built-in new years in the environment of exceedingly low rates of interest. As a result, the COVID-19 shock would be further aggravated. For instance, asset supervisors going through hefty outflows possibly will be obligated to sell off into dropping markets hence escalating descending price movements. Also, levered financiers may face additional margin calls as well as may be compelled to wind down their portfolios. Such kind of economic deleveraging would result in aggravation of selling pressures. In addition to targeted economic policies as well as fiscal measures by the government of Pakistan, the correct monetary and financial stability policies will be vital to support buttress the global economy.

As a result of COVID-19 hitting the financial markets of Pakistan, Foreign Direct Investment (FDI) as expected, witnessed a major decline in several sectors such as Tourism, Automotive, Oil & Gas, Coal, Real Estate, Aviation, Luxury goods, Retail as well as Entertainment due to the social restrictions, frequent price wars, lockdowns, as well as shutdowns. Nevertheless, there are growth prospects that can be harnessed in virtual tourism, online shopping, virtual health consultations, website building, E-Commerce, online booking of orders previously done at dealerships or showrooms, online courses, etc. Pakistan is in dire need of an investment strategy response to reverse some of the post-COVID-19 distress levied on investment as well as trade. In the wake of the disruptions instigated by COVID-19 besides the new opportunities it has provided, the 10-point agenda may act as an initial strategy response in an attempt to attract investment within Pakistan.

Firstly, industrial relocation under the CPEC-IC should be promoted to cater to the companies that are non-Chinese as well. Secondly, the provision of incentives to create backward linkage in small enterprises. Thirdly, fast-tracking of all currently incomplete CPEC Projects. Fourthly, deployment of 5G services and an attempt to expedite the deployment process so that industrial cooperation within industries can be enabled. A fifth, establishment of IT as well as security capacity to be taken into consideration since the hit of COVID-19 has turned the world of IT into a necessity and Pakistan is currently lagging far behind in terms of its technological infrastructure. The sixth supportive strategy may be to revisit priority sectors that should be selected for investment. Also, the provision of government incentives and

facilitation for industrial transformation to meet the new challenges will be of great assistance. A properly structured SME survival plan should be devised to help infant and struggling small businesses that make up a large proportion of Pakistan's GDP.

For the past several years, the government of Pakistan has largely focused on growth derived from exports mainly. Conversely, the outbreak of COVID-19 has unexpectedly exposed the country and its economic sectors to vulnerability whereby trade had to be completely banned, with a complete halt on foreseeable investment opportunities. This resulted in approximately 4.64% of the expected loss in the country's GDP. Hence, it would be ideal if the government starts supporting the domestic enterprises and provide incentives to promote larger sales within the country rather than depending immensely on its export revenues and foreign remittances. Central banks have always remained crucial towards the preservation of the constancy of worldwide financial markets as well as sustaining the flow of credit to the complete economy. However, this catastrophe is not just about liquidity issues. It is principally about creditworthiness at a phase when large divisions of the comprehensive economy have come to a widespread stoppage. As an outcome, fiscal policy will act as an important role to play in this scenario.

Fiscal, monetary as well as financial policies, would have to be used to aim to cushion the grave impacts of the COVID-19 shock, also, to ensure a steady, justifiable recovery once the pandemic is under control. Also, close and continuous international coordination will be essential to support vulnerable countries, and to restore market confidence, so that financial stability risks can be contained. The IMF seems willing to assert the full weight of its resources to help protect the most vulnerable economies of the world and aims to strengthen the eventual recovery in the long-term. Supervisory authorities would have to however monitor developments at banks in a very close manner. The State Bank of Pakistan has no doubt helped by reducing interest rates in the country but added efforts would be required to fully recover from this financial downturn. The goal must be targeted towards the preservation of banks' financial strength besides the provision of complete transparency all over the financial segment of Pakistan. Establishments would correspondingly have to be attentive to probable financial stability pressures posed by the world outside the banking scheme. This would require an augmented focus on asset managers as well as exchange-traded funds, precisely monitoring investors who might end up liquidating risky investments unexpectedly.

Great fluctuation in prices of assets can rapidly put marketplaces as well as organizations under the burden. Although the market operation has been able to endure large punches in asset prices far-off, subjective evidence advocates that liquidity has been narrowing

in many markets. There are strains in US dollar funding markets, where non-US banks in addition to corporates borrow in US dollars. Overall, policymakers must perform conclusively in addition to collaboration at the international level to preserve money as well as financial permanency during this tenure of unusual trials. In addition to these overall measures that can help lift the economy in this severe financial crisis, there are growth opportunities as well that can be harnessed in some of the struggling sectors. Firstly, in the sector of Food & Personal care, owing to health hazards that are posed by unpackaged food the demand for more hygienic canned food items, and packaged food is expected to accelerate. Even the food products that are to be consumed fresh would need proper air-tight, as well as sanitized packaging to be acceptable by the consumers as people get more conscious about their health concerns due to the wide-spread of the virus.

Also, the growing need for sanitization has radicalized consumer goods as well as other household products. Hand sanitizers, anti-bacterial soaps, cleaners, anti-bacterial detergents, and all other related household products having anti-bacterial properties are on the look for by the consumers. A rise in demand for such products can be positively expected giving the sector a sudden boost as the panic buying of customers generates handsome profits for its manufacturers. Currently, there are very few companies in Pakistan providing these products, however, with an increase in demand and big profit prospects many new entrants would join the race to benefit from a profitable scenario. Covid-19 has redefined this sector of niche and has created a huge market of around 200 million people for it. In addition to domestic organizations, foreign companies can be attracted to invest in this segment of the sector as well to reap the fruits of this newly-established demand. On the other hand, dependence on the traditional type of logistical solutions has proved to be quite detrimental during the tenure of this crisis. Digitally equipped, as well as contactless logistical solutions would be much more appropriate as per the current circumstances. According to the expectations posed by the current scenario, the global value chains would be transformed into regional as well as local value chains. Ecommerce would be the future mode of trade instead. Investment opportunities in businesses involving the use of technology to deliver tangible goods rather than involving human hands as done previously will flourish. Courier services will require the use of drones as is already practiced in various developed countries to deliver the packages.

With its complete dependence on the traditional form of logistical solutions, Pakistan requires new along with innovative solutions if it is to overcome the latest financial crisis posed by this novel Coronavirus. This loophole that exists widely in the Pakistani market can be exploited by already existent courier companies such as DHL, FedEx, etc. in an attempt

to bring in the solutions as well as capitalize on this untapped potential. Entertainment and Communications are the two areas that have a perceived good outlook besides sectors responsible for the provision of necessities. This involves services that revolve around in-home entertainment and communications. These are expected to perform well during this crisis period due to the new definition of necessity technology has created. Zoom, a video conferencing service, as well as streaming services including Netflix as well as Amazon Prime have experienced a rise in its usage during times of home quarantine.

Sports events will now be preferred in a completely different environment with the fans sitting in their living rooms and watching it all online. Virtual rooms are on the outlook of becoming a real solution to the problems that are posed by social distancing. Having a large part of the population of Pakistan consisting of Millennials that have just begun to earn, Pakistan is well-informed of such kind of entertainment and communications solutions which are easily accessible internationally. This kind of untapped market provides an opportunity for international as well as domestic IT companies to invest in Pakistan. Even though banks were already providing internet-based solutions on a wider scale in Pakistan, the usage of these services was only by a precise group of people. The post-COVID-19 world has resulted in the internet becoming an important platform that must be sought to ensure safety from the pandemic. This will result in a sharp increase in internet-based financial solutions, making the banks ensure inclusivity. With a large proportion of demographic still not privy to the paybacks of contactless banking, the investment in such solutions by banks will prove quite profitable. Lucrative investment occasions exist in the financial sector of Pakistan, in approaches that focus on market penetration.

Pakistan was already trying to work towards attracting investment in the sector of E-Commerce when the Covid-19 entered the country. The social impact this virus had made this sector move past the traditional physical commerce. Added to this, foreign investment opportunities were presented in the form of increased online retail demand as well as a minimal number of solutions available in Pakistan. Education provision via online platforms has changed the dynamics of education around the globe. This resulted in the replacement of traditional classrooms with online classes. Virtual spaces are now the only option to conduct parent-teacher meetings to discuss the performance of students with their parents as the spread of the pandemic did not allow physical contact. On the contrary, the world is still struggling as to how to manage online examinations. In this new era, investment in technology-based education solutions would be very profitable. There are many opportunities such as Linda.

Edex, Skillshare, and Udemy for which demand has drastically increased in developed as well as developing countries.

The provision of medical consultations via online platform due to COVID-19 has not only exposed the susceptibilities in our health systems but also has developed new forms of health solutions. From the installation of disinfectant walkthrough tunnels to as far as the development of health chatbots, this pandemic has pushed technology into providing us with health solutions. The usage of the Internet of Things (IoT) as well as simulations, is speeding up the process of testing innovative medicines. Technology powered by artificial intelligence (AI) is aiding in tracking the outbreak, keep hospitals clean, distribute supplies, as well as develop vaccines, with governments encouraging universities as well as corporations to expedite innovations. The decision to invest in such solutions is not only the need of the hour but is also demanded by the future as well.

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APPENDICES

1. RESULTS – ABNORMAL RETURNS

	PRE-COVID-19						POST-COVID-19					
	Average			Beta	Mean	Std Dev.	Average			Beta	Mean	Std Dev.
	MAR	MKAR	RAR				MAR	MKAR	RAR			
1 KSE 100	(0.0000)	0.0002	(0.0001)	1.0000	0.0002	0.0121	(0.0000)	(0.0022)	0.0031	1.0000	(0.0022)	0.0250
2 Commercial Banks	(0.0000)	0.0001	0.0000	0.8826	0.0003	0.0154	0.0000	(0.0031)	0.0000	0.8632	(0.0053)	0.0246
3 Oil & Gas	(0.0005)	(0.0004)	(0.0005)	1.0503	(0.0002)	0.0198	(0.0000)	(0.0000)	(0.0000)	1.2485	(0.0022)	0.0363
4 Food & Personal Care	(0.0012)	(0.0011)	(0.0012)	1.0669	(0.0009)	0.0170	(0.0000)	0.0021	0.0000	0.9102	(0.0001)	0.0259
5 Tobacco	(0.0017)	(0.0015)	(0.0017)	0.4362	(0.0013)	0.0341	0.0000	(0.0020)	-	0.1658	(0.0042)	0.0226
6 Fertiliser	(0.0010)	(0.0009)	(0.0010)	0.7718	(0.0007)	0.0125	0.0000	0.0025	0.0000	0.9278	0.0003	0.0262
7 Cement	(0.0014)	(0.0013)	(0.0014)	1.4616	(0.0011)	0.0228	0.0000	0.0053	0.0000	1.1366	0.0031	0.0369
8 Chemical	(0.0012)	(0.0010)	(0.0012)	1.1863	(0.0009)	0.0181	0.0000	0.0027	0.0000	0.9549	0.0005	0.0276
9 Pharmaceuticals	(0.0002)	(0.0001)	(0.0002)	0.9766	0.0001	0.0174	0.0000	0.0046	0.0000	0.7107	0.0024	0.0218
10 Power Gen & Dist	(0.0012)	(0.0011)	(0.0012)	0.8375	(0.0009)	0.0158	(0.0000)	(0.0003)	0.0000	0.9334	(0.0025)	0.0283
11 Auto Assembler	(0.0014)	(0.0013)	(0.0014)	1.3046	(0.0011)	0.0217	0.0000	0.0016	0.0000	1.1019	(0.0006)	0.0326
12 Textile Composite	(0.0006)	(0.0005)	(0.0006)	0.6961	(0.0003)	0.0193	0.0000	(0.0012)	0.0000	0.9625	(0.0034)	0.0280
13 Oil & Gas MKT	(0.0017)	(0.0016)	(0.0017)	1.2751	(0.0014)	0.0190	0.0000	(0.0001)	0.0000	1.2438	(0.0023)	0.0342
14 Insurance	(0.0006)	(0.0005)	(0.0006)	0.8411	(0.0003)	0.0190	(0.0000)	0.0021	-	0.5421	(0.0001)	0.0198
15 Inv Banks	0.0001	0.0002	0.0001	1.3635	0.0004	0.0274	-	0.0024	(0.0000)	1.1201	0.0002	0.0375
16 Tele & Comm	(0.0011)	(0.0010)	(0.0011)	1.3109	(0.0008)	0.0222	0.0000	0.0050	0.0000	1.0957	0.0028	0.0359

(KSE Stocks, 2020) (Yahoo Finance, 2020) (Pakistan Stock Exchange, 2020)

2. RESULTS – ARCH MODEL

S. No	Sectors (Pakistan)	PRE-COVID-19						POST-COVID-19									
		Mean Equation		Variance Equation		ARCH-LM Test		Mean Equation		Variance Equation		ARCH-LM Test					
		Variable	Coefficient	Probability	Variable	Coefficient	Probability	F-stat	Probability	Variable	Coefficient	Probability	F-stat	Probability			
1	KSE 100	C	0.0001	0.9466	C	0.0008	0.8171	0.5492	0.4003	C	0.0023	0.2330	C	0.0000	0.3951	1.8628	0.1720
		ARCH (1)			ARCH (1)	0.0678	0.6702			ARCH (1)	0.2367	0.1797			ARCH (1)	0.2367	0.1797
		GARCH (1)			GARCH (1)	0.3493	0.0500			GARCH (1)	0.7254	0.0012			GARCH (1)	0.7254	0.0012
2	Commercial Banks	C	0.0000	0.4156	C	0.0001	0.0136	0.0036	0.8072	C	0.0000	0.3464	C	0.0000	0.2054	0.0000	0.9773
		ARCH (1)			ARCH (1)	0.2434	0.0012			ARCH (1)	0.2932	0.0780			ARCH (1)	0.2932	0.0780
		GARCH (1)			GARCH (1)	0.3059	0.0012			GARCH (1)	0.6743	0.0000			GARCH (1)	0.6743	0.0000
3	Oil & Gas	C	0.0000	0.7230	C	0.0000	0.1700	0.0000	0.9773	C	0.0000	0.2762	C	7.91E-05	0.0413	0.4111	0.5237
		ARCH (1)			ARCH (1)	0.1800	0.0357			ARCH (1)	0.9022	0.0130			ARCH (1)	0.9022	0.0130
		GARCH (1)			ARCH (2)	0.0213	0.8647			GARCH (1)	0.2945	0.1146			GARCH (1)	0.2945	0.1146
4	Food & Personal Care	C	0.0000	0.4407	C	0.0000	0.0781	0.0000	0.8378	C	0.0000	0.0293	C	0.0000	0.0029	0.0000	0.7606
		ARCH (1)			ARCH (1)	0.1636	0.0475			ARCH (1)	0.1203	0.0099			ARCH (1)	0.1203	0.0099
		GARCH (1)			GARCH (1)	0.6780	0.0000			ARCH (2)	0.3939	0.0053			GARCH (1)	0.4029	0.0000
5	Tobacco	C	0.0010	0.2242	C	0.0001	0.0000	0.6128	0.4279	C	0.0000	0.1480	C	0.0000	0.7627	0.0050	0.9441
		ARCH (1)			ARCH (1)	0.1377	0.0062			ARCH (1)	0.1139	0.0103			ARCH (1)	0.1139	0.0103
		GARCH (1)			GARCH (1)	0.6128	0.0000			GARCH (1)	1.1350	0.0000			GARCH (1)	1.1350	0.0000
6	Fertilizer	C	0.0010	0.1757	C	0.0000	0.1834	0.9068	0.9898	C	0.0000	0.1403	C	0.0000	0.45	2.8223	0.0920
		ARCH (1)			ARCH (1)	0.1148	0.0488			ARCH (1)	0.3495	0.1903			ARCH (1)	0.3495	0.1903
		GARCH (1)			GARCH (1)	0.3487	0.0000			GARCH (1)	0.6266	0.0100			GARCH (1)	0.6266	0.0100
7	Cement	C	0.0015	0.2569	C	0.0001	0.2037	1.0581	0.2918	C	0.0000	0.7661	C	0.0000	0.8353	2.7820	0.2001
		ARCH (1)			ARCH (1)	0.1205	0.0849			ARCH (1)	0.1358	0.3465			ARCH (1)	0.1358	0.3465
		GARCH (1)			GARCH (1)	0.7810	0.0000			GARCH (1)	0.6753	0.0003			GARCH (1)	0.6753	0.0003
8	Chemical	C	0.0013	0.2158	C	0.0001	0.1247	0.3525	0.5012	C	0.0000	0.2892	C	2.28E-05	0.797	2.1755	0.3451
		ARCH (1)			ARCH (1)	0.1592	0.0470			ARCH (1)	0.1297	0.2554			ARCH (1)	0.1297	0.2554
		GARCH (1)			GARCH (1)	0.6557	0.0002			GARCH (1)	0.8985	0.0002			GARCH (1)	0.8985	0.0002
9	Pharmaceuticals	C	0.0000	0.9764	C	0.0000	0.4024	1.3936	0.2388	C	0.0000	0.2068	C	4.13E-05	0.2194	1.0209	0.2757
		ARCH (1)			ARCH (1)	0.0258	0.6124			ARCH (1)	0.2657	0.3423			ARCH (1)	0.2657	0.3423
		GARCH (1)			GARCH (1)	0.8328	0.0000			GARCH (1)	0.6428	0.0020			GARCH (1)	0.6428	0.0020
10	Power Gen & Dist	C	0.0013	0.1116	C	0.0000	0.0001	0.0348	0.8526	C	0.0000	0.0623	C	0.0000	0.4372	0.0746	0.4811
		ARCH (1)			ARCH (1)	0.0961	0.0783			ARCH (1)	0.3124	0.1890			ARCH (1)	0.3124	0.1890
		GARCH (1)			GARCH (1)	0.7412	0.0000			GARCH (1)	0.6911	0.0017			GARCH (1)	0.6911	0.0017
11	Auto Assembly	C	0.0020	0.1351	C	0.0001	0.1994	0.1004	0.7516	C	0.0000	0.3019	C	0.0000	0.5145	0.0854	0.1386
		ARCH (1)			ARCH (1)	0.1389	0.0827			ARCH (1)	0.1916	0.1592			ARCH (1)	0.1916	0.1592
		GARCH (1)			GARCH (1)	0.8604	0.0012			GARCH (1)	0.7708	0.0000			GARCH (1)	0.7708	0.0000
12	Textile Composite	C	0.0000	0.7604	C	0.0001	0.0014	0.1962	0.6581	C	0.0000	0.8098	C	0.0000	0.3413	0.6834	0.7769
		ARCH (1)			ARCH (1)	0.6380	0.4421			ARCH (1)	0.4380	0.2942			ARCH (1)	0.4380	0.2942
		GARCH (1)			GARCH (1)	0.6610	0.0000			GARCH (1)	0.5219	0.0099			GARCH (1)	0.5219	0.0099
13	Oil & Gas (M)	C	0.0020	0.0941	C	0.0000	0.3452	0.0036	0.9859	C	0.0000	0.0798	C	0.0000	0.8917	1.3623	0.2475
		ARCH (1)			ARCH (1)	0.0056	0.9780			ARCH (1)	0.1777	0.3790			ARCH (1)	0.1777	0.3790
		GARCH (1)			GARCH (1)	0.9012	0.0000			GARCH (1)	0.8380	0.0028			GARCH (1)	0.8380	0.0028
14	Insurance	C	0.0000	0.2684	C	0.0001	0.5021	0.0013	0.9714	C	0.0000	0.1174	C	0.0000	0.4956	0.1137	0.7170
		ARCH (1)			ARCH (1)	0.1215	0.0580			ARCH (1)	0.1849	0.2313			ARCH (1)	0.1849	0.2313
		GARCH (1)			GARCH (1)	0.6988	0.0020			GARCH (1)	0.7910	0.0013			GARCH (1)	0.7910	0.0013
15	Irr Banks	C	0.0001	0.9848	C	0.0004	0.0003	0.0462	0.8284	C	0.0000	0.1570	C	0.0002	0.0947	0.6828	0.4117
		ARCH (1)			ARCH (1)	0.2512	0.0020			ARCH (1)	0.0182	0.7971			ARCH (1)	0.0182	0.7971
		GARCH (1)			GARCH (1)	0.2587	0.1599			ARCH (2)	0.4945	0.0191			ARCH (2)	0.4945	0.0191
16	Tele & Comm	C	0.0017	0.2344	C	0.0001	0.1926	0.2168	0.6239	C	0.0000	0.1467	C	4.95E-05	0.5944	3.4442	0.0681
		ARCH (1)			ARCH (1)	0.1152	0.0720			ARCH (1)	0.2867	0.1524			ARCH (1)	0.2867	0.1524
		GARCH (1)			GARCH (1)	0.6932	0.0010			GARCH (1)	0.6823	0.0010			GARCH (1)	0.6823	0.0010

(Yahoo Finance, 2020) (KSE Stocks, 2020) (Pakistan Stock Exchange, 2020)

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