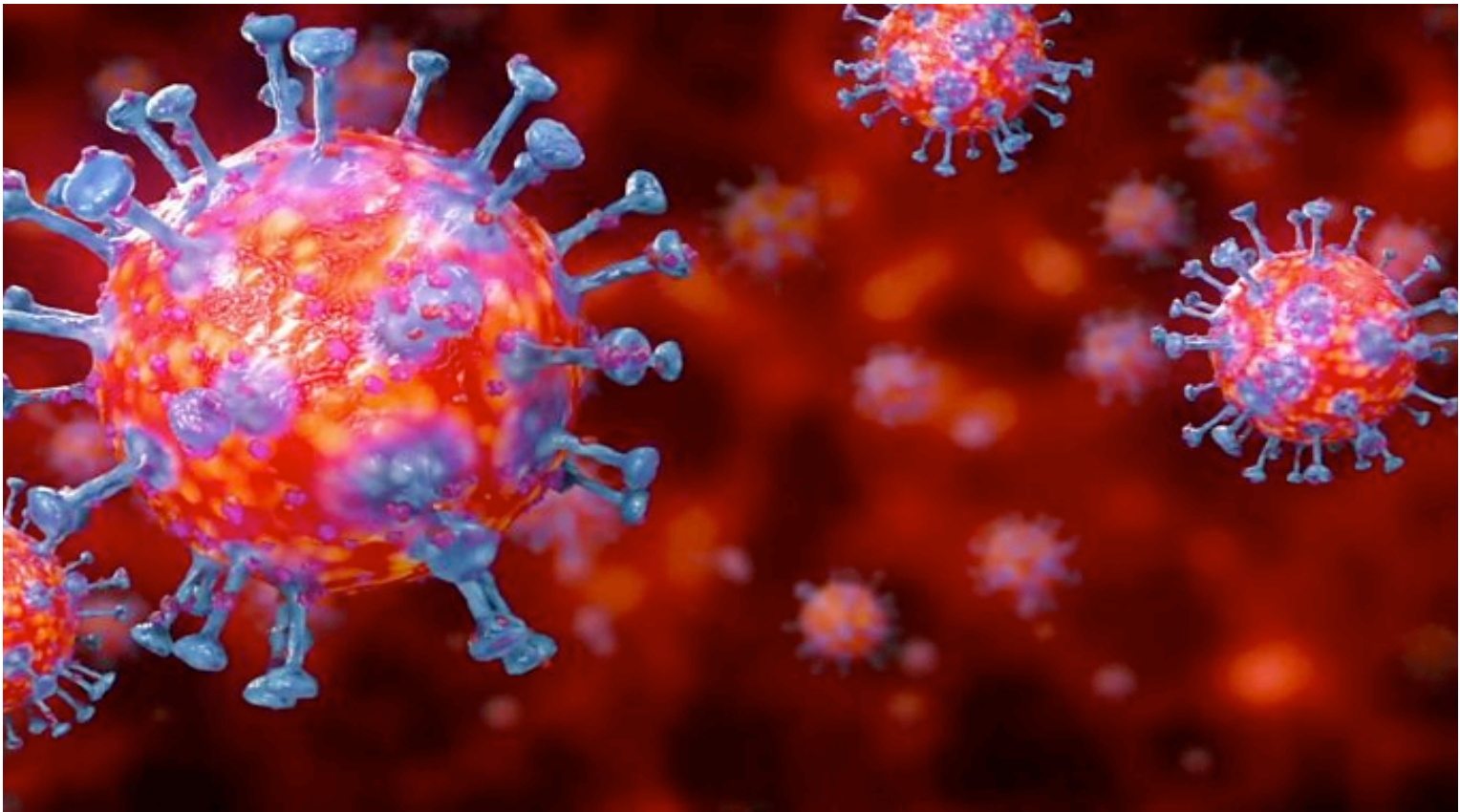


eBook

SHORT NOTES ON THE ECONOMY DURING THE COVID-19 CRISIS



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Edited By
Asma Hyder

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The views expressed in this document are those of the authors and not those of the Institute of Business Administration, IBA, Karachi. The editors would like to acknowledge the important and timely contribution from all the authors.

Preamble

The coronavirus – COVID-19 – pandemic has had a huge, catastrophic, impact on the global economy and on economies of almost all countries. Even those countries which were posting record-breaking profits just four weeks ago, such as the US and Germany, are now faced with a substantial fall in incomes, earning, employment and profits. From record low unemployment levels, these countries are already projecting a huge spike in unemployment, and all indicators suggest that a global recession is now imminent.

Unlike economies which were doing well, Pakistan's economy had been showing slowing signs since mid-2018. Estimates for the current fiscal year FY20 GDP growth rate before the coronavirus struck were a mere 1.8 to 2.2 percent and in January and February 2020 the inflation rate was in the range of 14 percent with food inflation around 23 percent, perhaps even higher in rural areas. Calculations by economists over the last twenty months since July 2018 suggested that as many as 2.2 million people had been added to the unemployed and those under the poverty level may have risen by as many as 10 million. Even before the coronavirus struck, Pakistan's economy was in a shamble. Things have been made far worse in a matter of four weeks. Expectations of significantly higher unemployment and poverty and considerably lower GDP growth and per capita income for FY20 are now certain.

Despite the government's Rs 1.2 trillion relief package announced on 24 March, there are many concerns about targeting and its efficacy. How will the non-waged, daily workers, of the informal sector who make up most of Pakistan's work force benefit? Not having effective distributional systems, there are fears of elite capture and government failure in all government initiatives. Even the Benazir Income Support Programme (BISP), which targets 5.5 million women and is going to be a key mechanism to distribute these new government funds, has been seen to have many leakages. Nevertheless, the BISP might have to be the most effective conduit for delivering enhanced transfers.

Perhaps the COVID-19 crisis will allow the government to rethink its strategies and interventions. Strangled by an IMF programme, perhaps the government needs to loosen this strangelhold and considerably increase spending, particularly that which focuses on job creation, especially of the low-income, low-skill workers. This is also a good moment to reconsider and increase funding for the social sectors, particularly health and education, where it has been made amply clear that Pakistan's health delivery mechanism is utterly incapable of dealing with even a small challenge, leave alone one on the impending scale of the COVID-19. This might also be an opportunity to launch a Universal Basic Income programme, a guaranteed minimum income scheme for all citizens regardless of the nature of work.

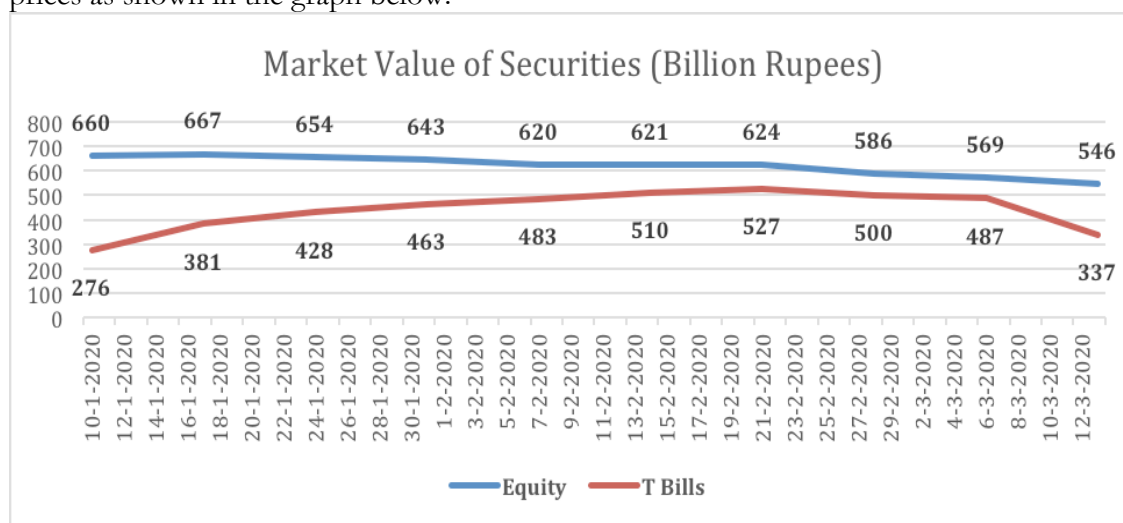
An unprecedented crisis requires unprecedented and exceptional leadership and responses. Will this be its undoing, or will Pakistan's government come up to these high expectations?

S Akbar Zaidi
Executive Director
IBA

Foreign Portfolio Investment In Pakistan During the COVID-19 Outbreak

Numair Jadoon¹

Hot money was recently the talk of town in the investment community. Its inflow warded pressures off the nominal exchange rate during the last six months. Foreign investors were lured by high interest rates on Pakistan's T-Bills and PIBs in an environment when globally more than 15 trillion dollars of debt had negative yields. Governments of some European countries, e.g. Germany, raised huge sums in negative yielding debt. In this environment, double-digit nominal returns on Pakistan's government securities were nothing short of a golden goose to chase after for fixed income investors. The State Bank's policy of keeping discount rate relatively stable by cutting it by only 75 basis points in the recent monetary policy intervention has also criticized in business circles as it favors hot money over local businesses financing concerns. However, the black swan event of the COVID 19 pandemic has put a strain on that strategy. Pakistan reported its first case of COVID 19 on 26 of February. Prior to that date, foreign investors were pouring in money in fixed income securities, raising their market value from Rs 276 billion on January 10th to Rs 527 billion on 21st February. The market values of those securities plunged to Rs 500 billion on February 28^h and continued that trend to reach at Rs 337 billion on 13 March. Equity securities held by foreigners have also consistently lost market value on the back of slump in their share prices as shown in the graph below.

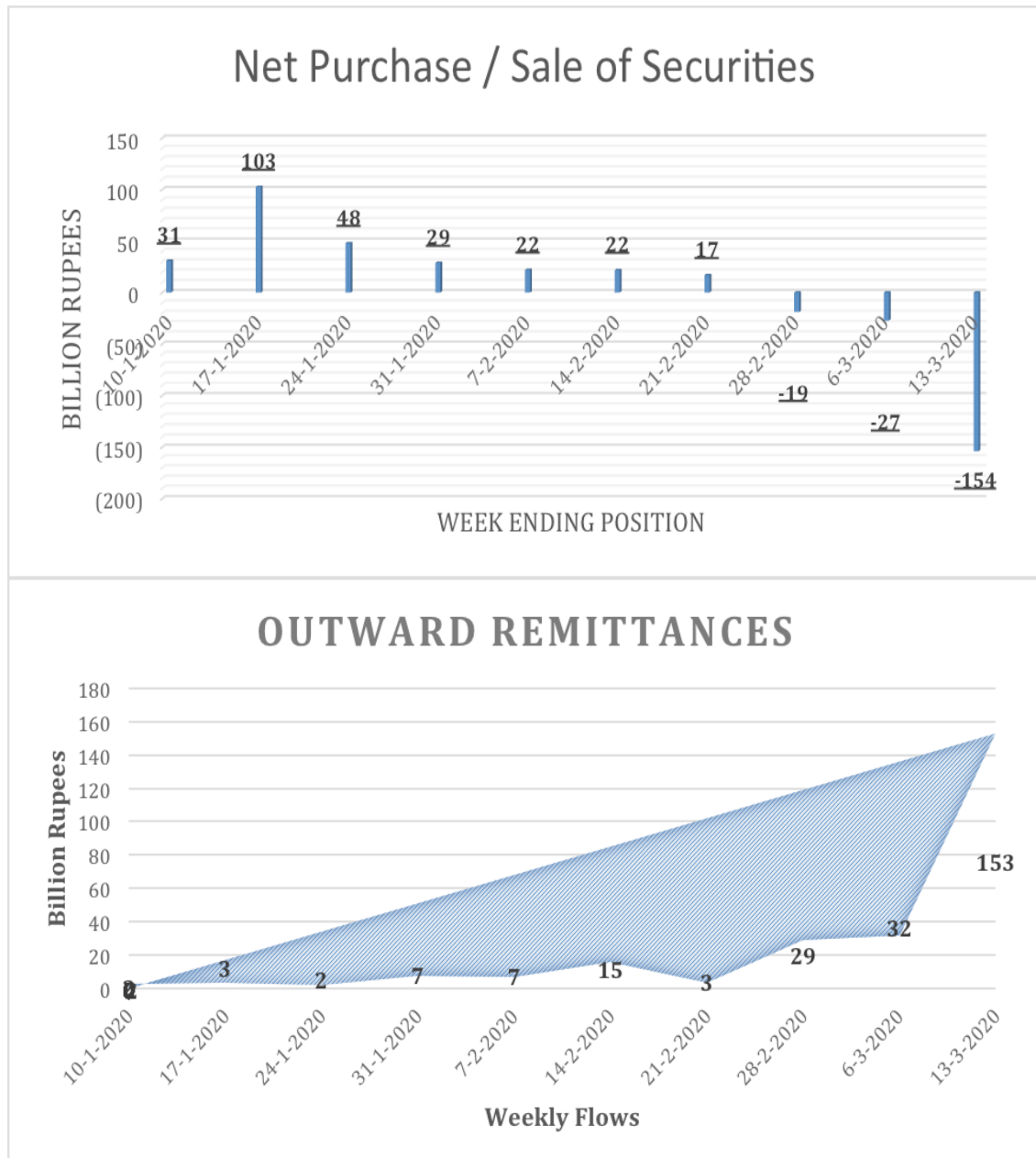


Source: State Bank of Pakistan: Special Convertible Rupee Account Dataset

Apart from the decline in the market value due to plunging prices, foreigners have also reduced their stakes in Pakistan's securities, as they have in many other countries. Sell off pressure was observed during the past three weeks (28th Feb to 13th March 2020) as cautious foreigners offloaded more than Rs 200 billion of securities. The trend exacerbated during March and is expected to continue in a couple of weeks post March 13^h as well, specifically for equity securities as KSE-100 index has been in a free fall for a couple of days after March 13. This decline is in sharp contrast to the increase in foreign stakes observed before February 26. Thus, outbreak of COVID 19 in Pakistan can be characterized as an inflection point in this analysis. In addition to this entire sell off

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pressure, foreign investors have also increased their remittances from those sale proceeds to their respective countries. However, going forward, it is expected that dividend repatriation will ease off, as oil and gas exploration companies are expected to post lower profits on the back of lower international oil prices. Lower dividend repatriation will imply lower outward remittances. Weekly details are given in figures below.



Source: State Bank of Pakistan: Special Convertible Rupee Account Dataset

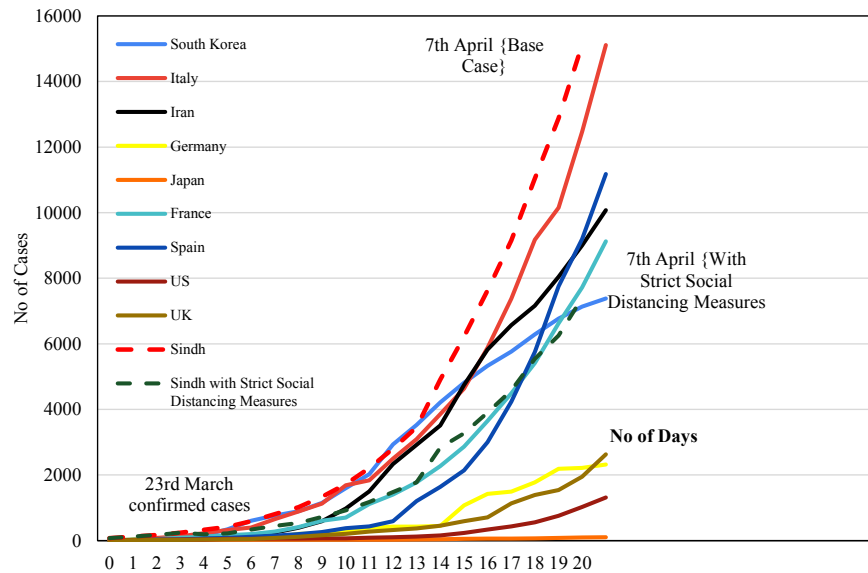
In my opinion, this entire slump in market values and continuous offloading by foreign investors will not persist longer and we will be back to normal after few months. This sentiment is slightly captured by the following excerpt from Principles of Political Economy (1848) by John Stuart Mill.

“What has so often excited wonder, is the great rapidity with which countries recover from a state of devastation, the disappearance in a short time, of all traces of mischief done by earthquakes, floods, hurricanes, and the ravages of war. An enemy lays waste a country by fire and sword, and destroys or carries away nearly all the movable wealth existing in it: all the inhabitants are ruined, and yet in a few years after, everything is much as it was before.”

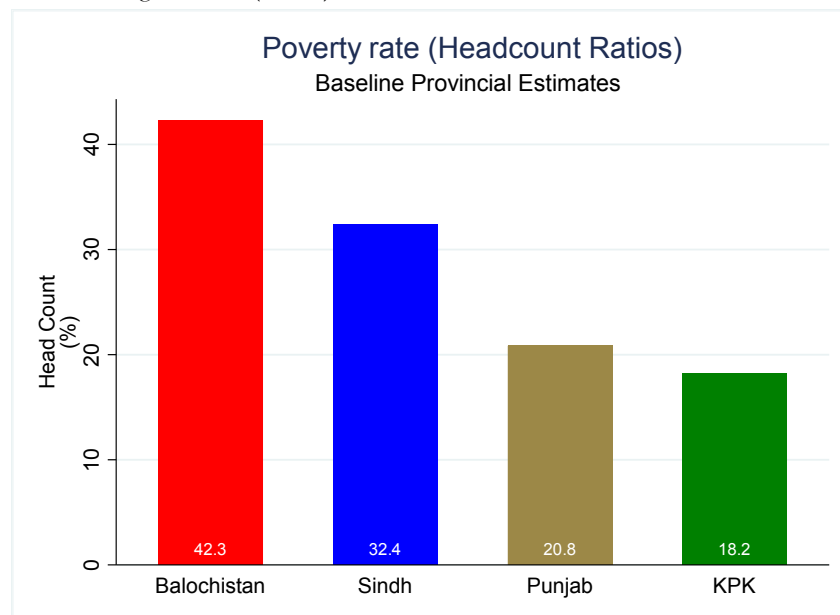
Poverty & Unemployment in Sindh: Some Data

Adnan Haider²

COVID-19 Sindh Cases (Projections)

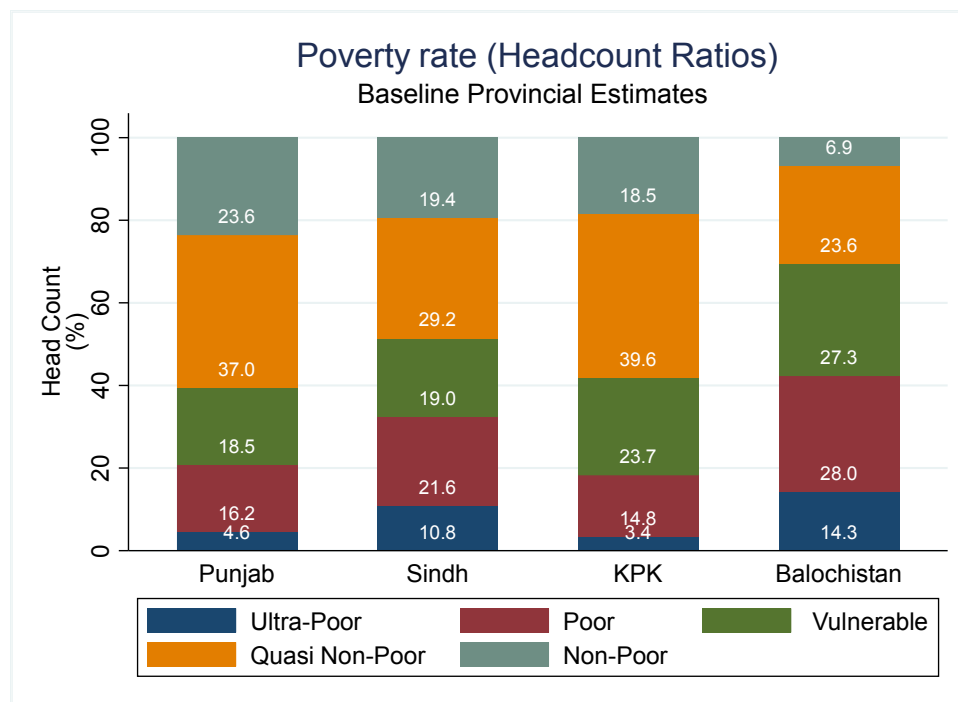


Source: World Health Organization (WHO)



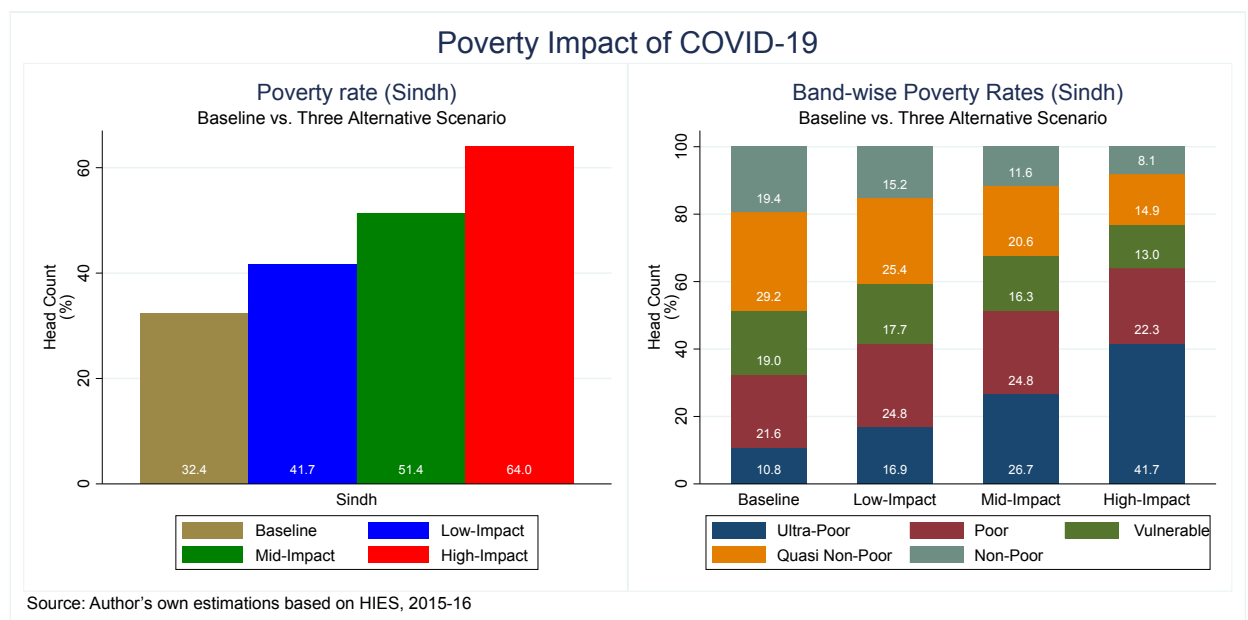
Source: Author's own estimations based on HIES, 2015-16

² Adnan Haider is Associate Professor at Institute of Business Administration, Karachi.



Source: Author's own estimations based on HIES, 2015-16

Note: Poverty band are defined using per capita household income as defined by Planning Commission in National Poverty Report 2015-16. Ultra-poor (<75% of Poverty Line) Poor (> 75% and < 100% of Poverty Line); Vulnerable (> 100% and < 125% of Poverty Line); Quasi Non-Poor (> 125% and < 200% of Poverty Line) and Non-Poor (> 200% of Poverty Line).



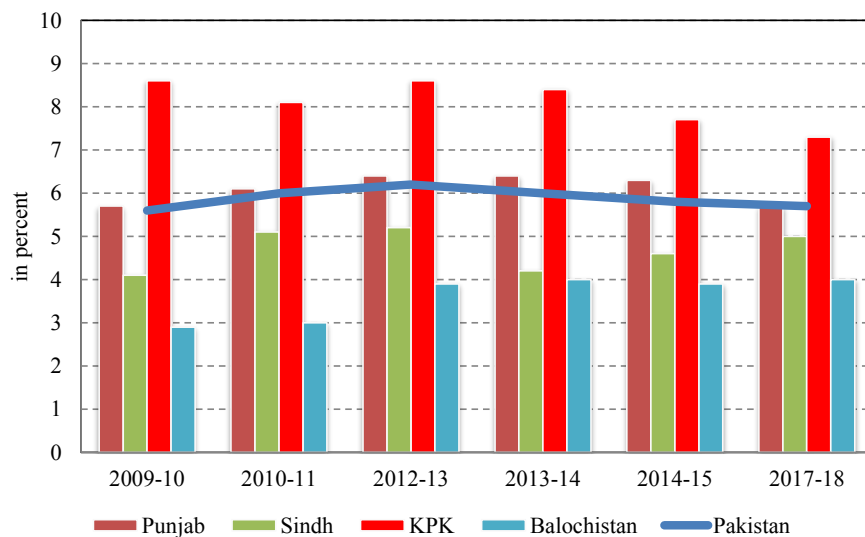
Source: Author's own estimations based on HIES, 2015-16³

Note: Poverty band are defined using per capita household income as defined by Planning Commission in National Poverty Report 2015-16. Three alternative scenarios

³ I followed the same methodology used in PIDE COVID-19 Bulletin No.1: COVID-19 in Pakistan: Caring for Poor and Vulnerable. However, I have restricted myself to Sindh province only.

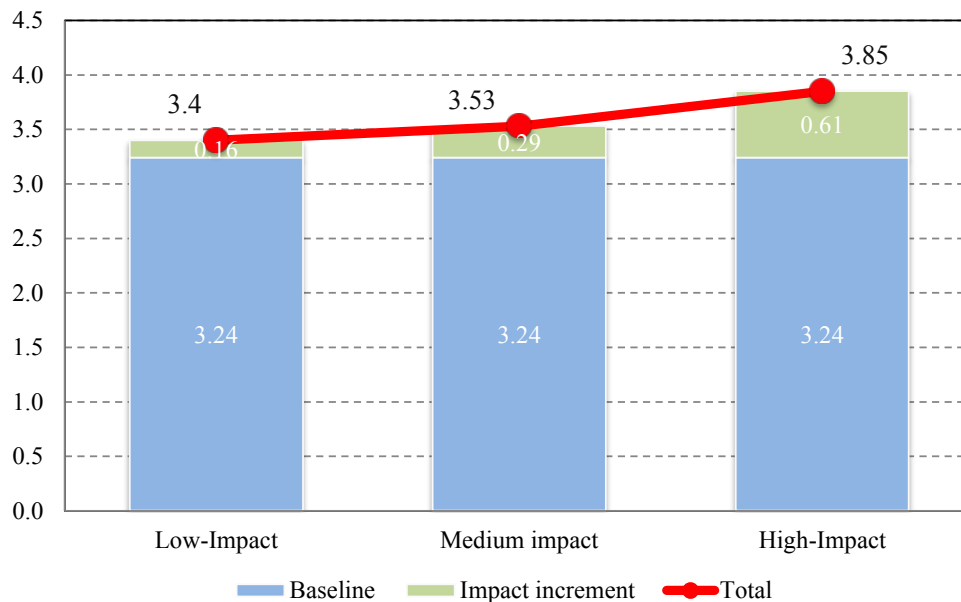
are: High impact [0 to 1.5 % GDP growth – massive economic recession]; Medium impact [from 1.5 to 2.5 % GDP growth – almost half of the projected GDP growth]; and Low impact [from 2.5 % to 3.5 GDP growth – mild recession in the economy). For each scenario, we have estimated poverty rate with the following five criteria's: Ultra-poor (<75% of Poverty Line) Poor (> 75% and < 100% of Poverty Line); Vulnerable (> 100% and < 125% of Poverty Line); Quasi Non-Poor (> 125% and < 200% of Poverty Line) and Non-Poor (> 200% of Poverty Line).

Unemployment Rate



Source: Labor Force Survey (various rounds).

Unemployment in Million (Sindh)



Source: Author's estimations based on Labor Force Survey, 2017-18.

Note: Baseline unemployment for Sindh is 3.24 million while the green part presents the additional unemployment for all categories due to COVID-19. Red Circles above each bar represents the total numbers unemployed, in millions.

Will COVID-19 Cause a Global Recession?

Wali Ullah⁴

On March 23, 2020, the outbreak of the coronavirus disease (Covid-19) had spread to 195 countries or territories. The virus had infected 382,057 people worldwide, and the number of deaths is around 16,565. The most severely affected countries outside of China include Italy, USA, Spain, and Germany. Having largely ignored Covid-19 as it spread across China, global financial markets reacted strongly last week when the virus spread to Europe and the Middle East, stoking fears of a global recession. Since then, Covid-19 risks have been priced so aggressively across various asset classes that the clouds of global recession hanging over for the last two months are becoming clearer on the darkened sky.

The statistical projections and indices won't be able to give a reliable forecast of GDP on the virus trajectory, effectiveness of containment efforts, and consumers' and firms' reactions are not known. Therefore, there is no single number that credibly foresees Covid-19's economic impact.

However, we should take a careful look at the market signals across asset classes and relate these signals to the history of epidemics and shocks, to foresee the future path of economy. Three major market signals point towards the global recession.

1. Last week's brutal drawdown in global financial markets might seem to indicate that the world economy is on a path to recession. Valuations of safe assets have spiked sharply, with the term premium on long-dated U.S. government bonds falling to near record lows at negative 116 basis points — that's how much investors are willing to pay for the U.S. government bonds. As a result, term structure models have signaled for the upcoming recession as evident in figure 1.

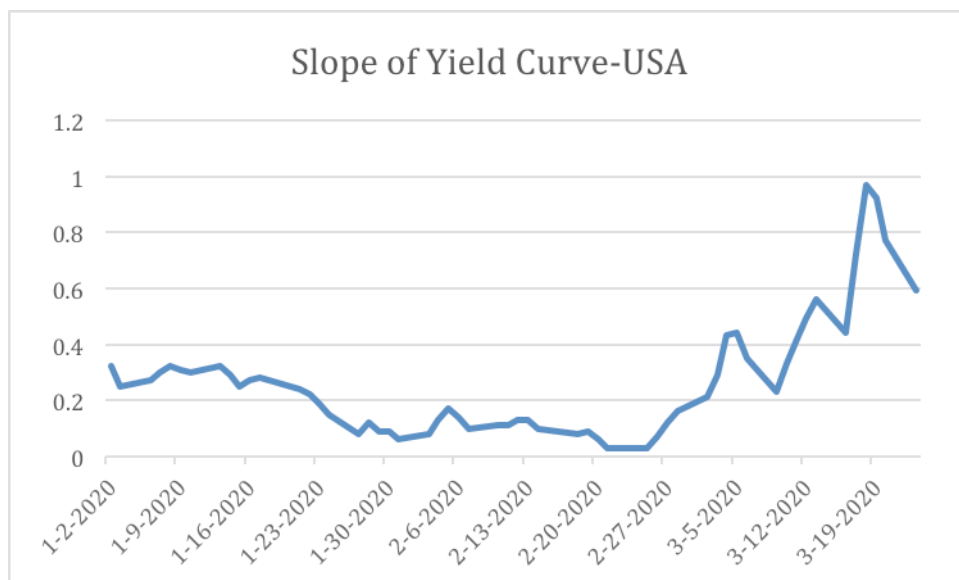


Figure 1: The figure shows the spread between 10-year and 1-year bond yields in the US market. Source Author Calculation based on US FED data.

⁴ Dr Wali Ullah is associate professor at Institute of Business Administration, Karachi.

2. On the other hand, volatility in the global stock markets have signaled the greatest strain, after the global financial crisis of 2008 as evident in figure 2.

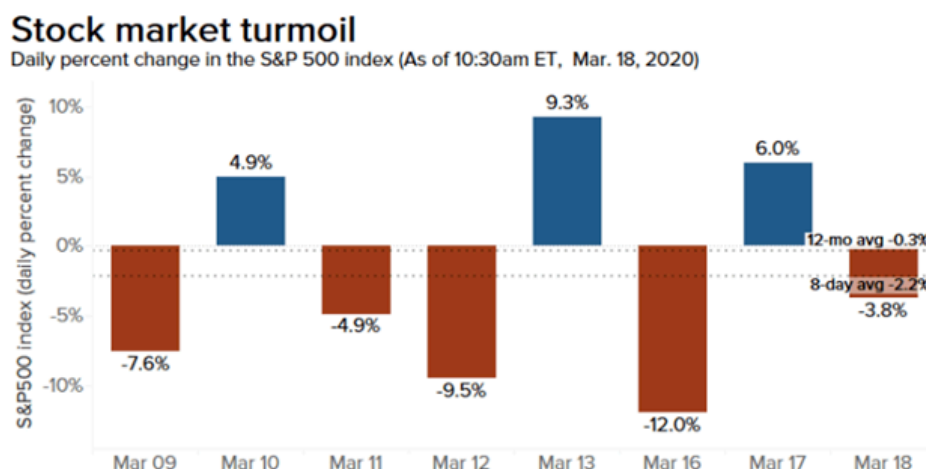
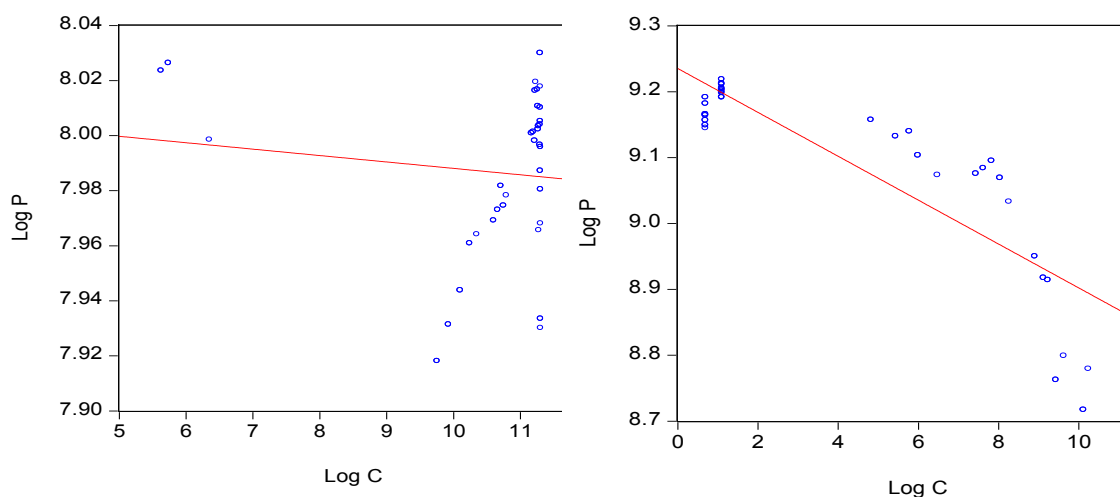


Figure 2: Stock Market Volatility

Source: FactSet, CNBC

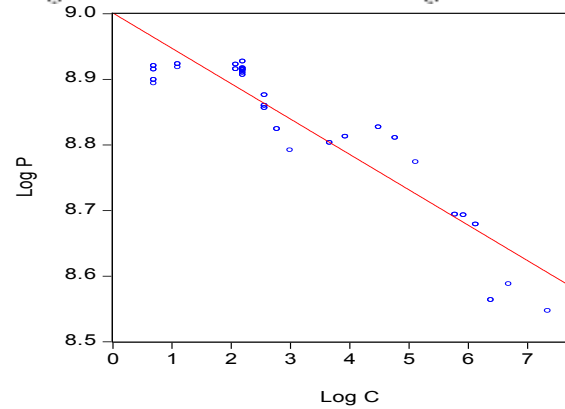
3. The scatterplot and panel regression analysis of COVID-19 cases and stock market indices analysis in figure 3 and table 1 of the nine countries that are severely affected by Covid-19 suggests that there is negative relationship between the number of COVID-19 cases and stock market performance. The overall elasticity in nine major economies (using panel fixed effect model) is about 0.102 as can be evident in the following equation.

$$\text{Log Price} = 9.307 - 0.102 \text{ Log Corona}$$



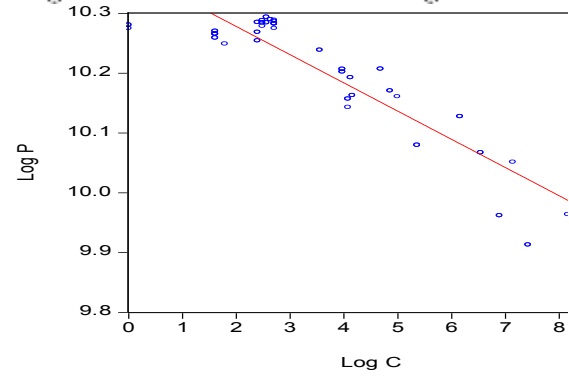
China:

$$\text{Log Price} = 8.001 - 0.002 \text{ Log Corona}$$



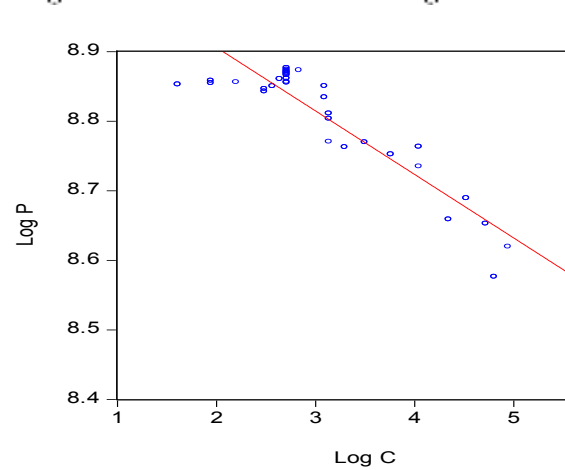
Italy:

$$\text{Log Price} = 9.235 - 0.333 \text{ Log Corona}$$



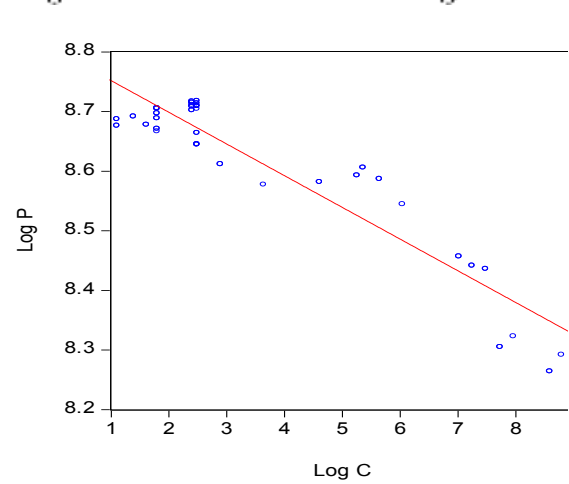
UK:

$$\text{Log Price} = 9.001 - 0.054 \text{ Log Corona}$$



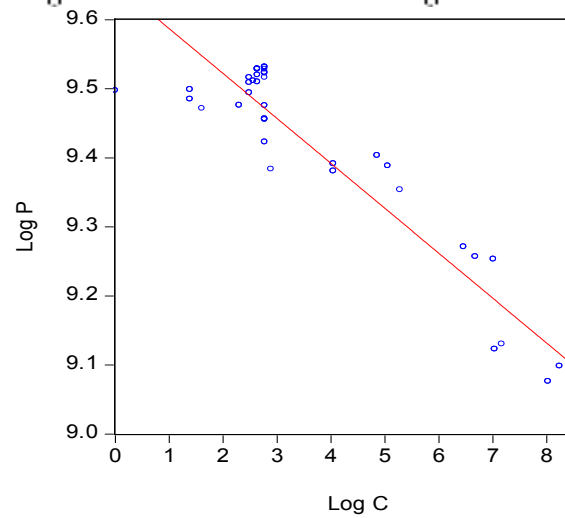
US:

$$\text{Log Price} = 10.371 - 0.047 \text{ Log Corona}$$



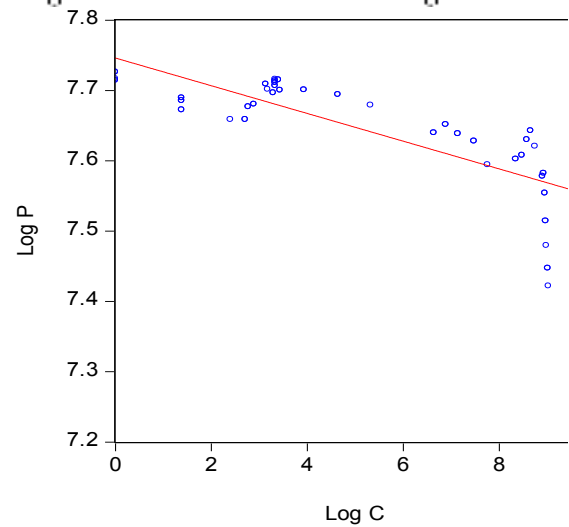
Australia:

$$\text{Log Price} = 9.008 - 0.091 \text{ Log Corona}$$



France:

$$\text{Log Price} = 8.805 - 0.053 \text{ Log Corona}$$

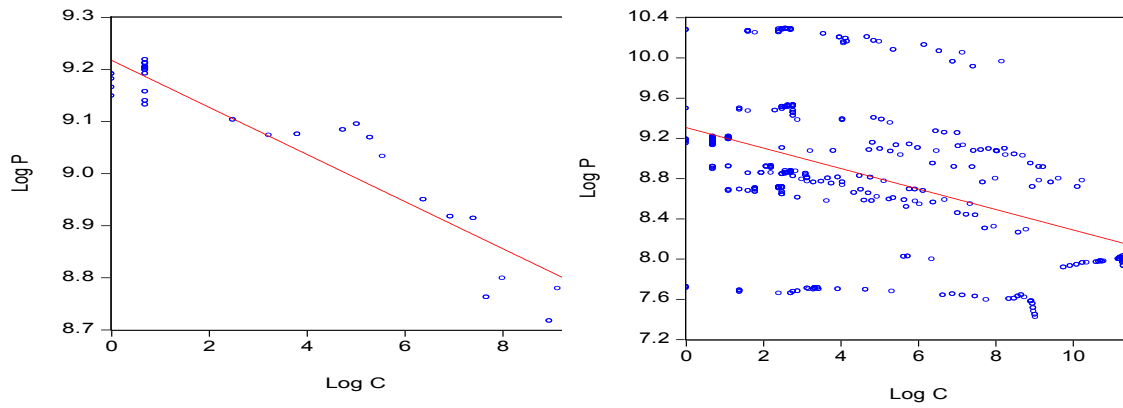


Germany:

$$\text{Log Price} = 9.652 - 0.065 \text{ Log Corona}$$

Korea:

$$\text{Log Price} = 7.746 - 0.019 \text{ Log Corona}$$



Singapore:

$$\text{Log Price} = 9.217 - 0.045 \text{ Log Corona}$$

Panel data:

$$\text{Log Price} = 9.307 - 0.102 \text{ Log Corona}$$

Figure 3: The figure shows the scatter plot along with the regression line between Log value of stock index (denoted as Log P) and Log value of COVID-19 cases in nine major economies of the world.

Table 1

Dependent Variable: Log Price				
Method: Panel Fixed Effect (GLS)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.0416	0.0072	1247.970	0.0000
LCRONA	-0.0429	0.0014	-29.9958	0.0000

Furthermore, the one month ahead forecast analysis of the stock market indices based on the state space framework of logarithmic values of stock indices indicate in figure 4 that the markets seem to go down soon.

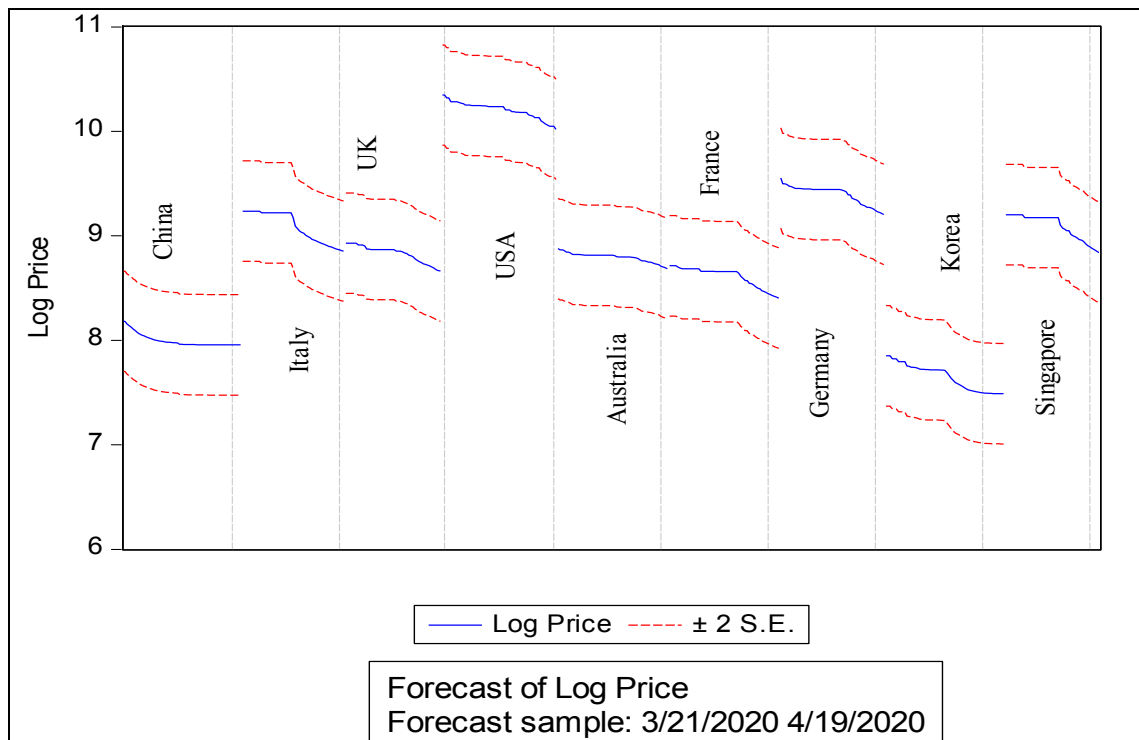


Figure 4: The figure shows the Log Price (logarithmic value of stock indices) forecasts for the one month ahead (March 21,2020 to April 19,2020) based on the in-sample data from January 21, 2020 to March 19, 2020 using the State Space framework of latent factors.

Overall, a closer look to all indicators reveals that a recession should be a foregone conclusion. However, in history one out of every three bear markets is non-recessionary. Over the last 100 years, we have seven such instances where bear markets did not coincide with recessions. Though the signals may be misleading, however, the recessionary risk is real. The vulnerability of major economies has risen as growth has slowed and the expansions of various countries are now less able to absorb shocks.

To avoid the recession, the path under Covid-19 depends on a range of drivers, such as the degree to which demand will be delayed or foregone, whether the shock is truly a spike or lasts, or whether there is structural damage, among other factors.

Finally, whatever is the outcome of Covid-19, history suggests that the global economy after Covid-19 will likely be different in several significant ways and we will have a very different world and economy. Covid-19 crises can spur the adoption of new technologies and business models as the SARS outbreak of 2003 is credited for the adoption of online shopping. Now as schools have closed in most part of the world could bring a revolution in the e-learning and e-delivery of education in the world. Furthermore, the digital efforts in Wuhan to contain the crisis via smart-phone trackers could also lead to the invention of new powerful public health tool.

Value of Social Distancing During COVID-19 Crisis: The Case of Sindh

Asma Hyder⁵

The COVID-19 is very easily transmitted from person to person through droplets and contaminated surfaces. China controlled the spread through mass testing and early interventions like strict measures of social distancing. Few other Asian countries are also taking proactive measures to limit the spread like Taiwan and Singapore. Many countries, including European countries like Italy, couldn't take early interventions including the social distancing and epidemic became uncontrollable. Now numerous countries, including India have taken very strict measures.

As compared to other regions of the country, Sindh took an early response but still in terms of social distancing it took long to take steps and the public adaptability toward the policies of social distancing has been slow. There were four reported cases on 27 February 2020 and this number reached 394 on 23 March 2020. The growth rate of cases in Sindh is: 22% from 27 Feb to 7 March, 60%⁸ to 18 March and 13.8% from 19 March to 23 March 2020.

Karachi is a very populated city and had around a 15 million population in the 2017 census. Social distancing is not easy to implement in this mega city. There are many workers in Karachi who come from surrounding cities and there are frequent movements not only within Sindh but also interprovincial travels. According to Johns Hopkins Center of Health Security:

“Social Distancing is a public health practice that aims to prevent sick people from coming in close contact with healthy people in order to reduce opportunities for disease transmission. It can include large scale measures like canceling group events or closing public spaces, as well as individual decisions such as avoid crowds.”

Sindh Government's Stance on Social Distancing:

The Sindh Government has been very proactive in terms of implementing policies regarding social distancing after 15 March 2020. This delay was mainly due to an increase in their capability in terms of mass testing. They imported testing kits and prepared many quarantine centers, which diverted the attention from social distancing. However, a preliminary analysis of social distancing in Sindh is presented in Table 1. Other provinces can learn lessons from this and even the Sindh Government can take further action considering the importance of social distancing in the coming days. The actions taken by the provincial government include:

- (1) Closure of schools and educational institutions
- (2) Closure of inter-city transport
- (3) Closure of inter-province land transport,
- (4) Closure of weddings, cinemas, shopping malls, mosques and other gathering places
- (5) Closure of Karachi and Sukker Airport

⁵ Asma Hyder is Associate Professor at Institute of Business Administration, Karachi.

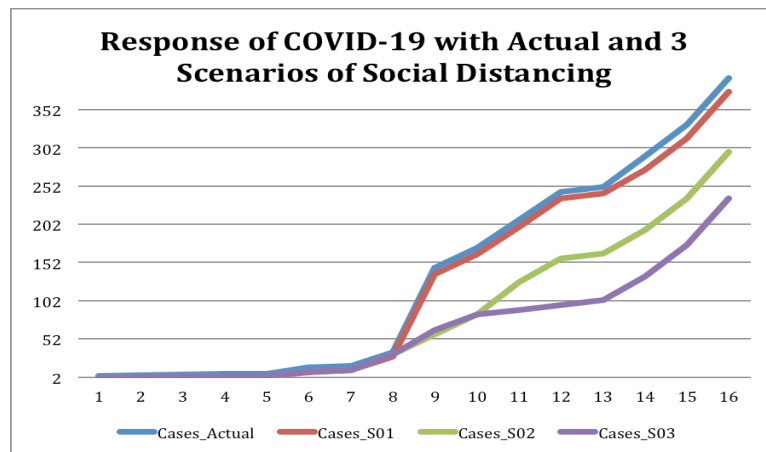
With the help of these indicators we have developed an index of social distancing from very low to high. Along with movement of this indexing scale we calculate the mean and standard deviations, finally this lead us to create three scenarios, i.e., with low social distancing policies, medium social distancing policies and high social distancing policies. This is presented in the following table, where zero shows no policy and one shows a respective policy implemented.

Social Distancing Policy in Sindh

Date	Sch_closure	Inter_city_Bus	Inter_Prov_Bus	Cinema/wedding s/public	Khi_Skr_Airport	Index	Scale
20-02-27	1	0	0	0	0	1	Low
20-02-28	1	0	0	0	0	1	Low
20-02-29	1	0	0	0	0	1	Low
20-03-01	1	0	0	0	0	1	Low
20-03-02	1	0	0	0	0	1	Low
20-03-03	0	0	0	0	0	0	V.Low
20-03-04	0	0	0	0	0	0	V.Low
20-03-05	0	0	0	0	0	0	V.Low
20-03-06	0	0	0	0	0	0	V.Low
20-03-07	0	0	0	0	0	0	V.Low
20-03-08	0	0	0	0	0	0	V.Low
20-03-09	0	0	0	0	0	0	V.Low
20-03-10	0	0	0	0	0	0	V.Low
20-03-11	0	0	0	0	0	0	V.Low
20-03-12	1	0	0	0	0	1	Low
20-03-13	1	0	0	0	0	1	Low
20-03-14	1	0	0	0	0	1	Low
20-03-15	1	0	0	1	0	2	Medium
20-03-16	1	0	0	1	0	2	Medium
20-03-17	1	0	0	1	0	2	Medium
20-03-18	1	0	0	1	0	2	Medium
20-03-19	1	1	1	1	0	4	High
20-03-20	1	1	1	1	0	4	High
20-03-21	1	1	1	1	0	4	High
20-03-22	1	1	1	1	0	4	High
20-03-23	1	1	1	1	1	5	V.High

Source: Various sources including print media and Government notifications

Based on the above scale we created three scenarios, which are presented in the graph below. The first blue line is representing the actual scenario; the other three are hypothetical scenarios with (1) low social distancing policies, (2) medium social distancing policies and (3) high social distancing policies. If the Sindh Government had opted for the high social distancing policy from March 1 2020 there would have been a difference of almost 36 percentage points. The actual and three hypothetical scenarios presented in the graph below are conservative estimates and the expected impact will probably be greater.



* Please note that this graph is based on simple assumptions. It is meant to illustrate the importance of policy measure to slowdown the spread of COVID-19.

Commodity Prices for Lower Income Group in Major Cities of Sindh During COVID-19

Shagufta Shabbar⁶

The COVID-19 pandemic is a ferocious dragon consuming each country in its way. Pakistan too has been hard hit due to the pandemic. Till 24 March there have been 6 deaths with 6 recoveries, with the total cases surging to 784 in the country.⁷ In Sindh there are a total of 399 cases so far. The speed with which new cases are popping shows that Pakistan is on a dangerous trajectory.

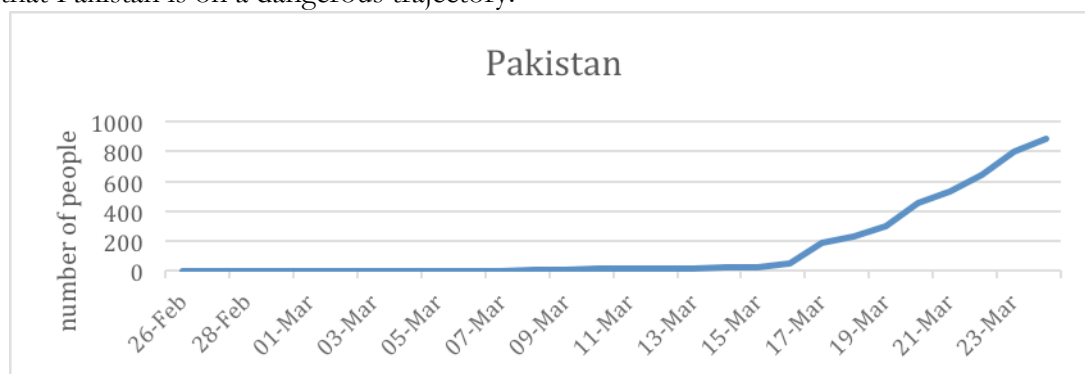


Figure 1. source: covid.gov.pk and various media announcements

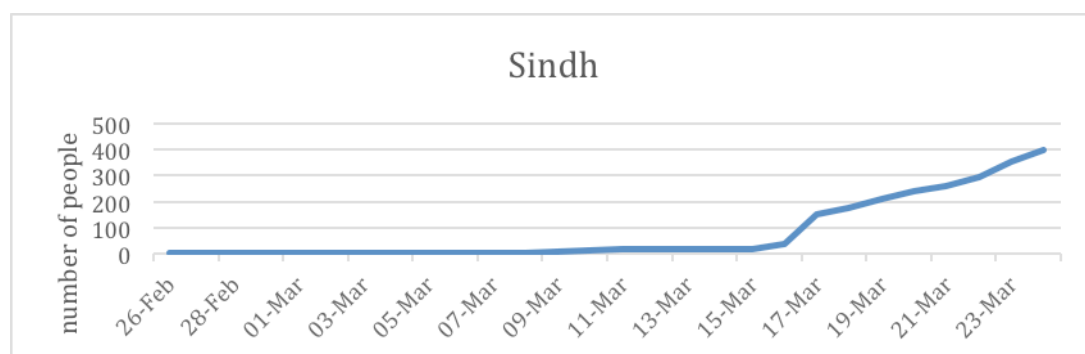


Figure 2. source: covid.gov.pk and various media announcements

The government has taken strict measures to lockdown the Sindh province where the numbers of cases are showing exponential growth. Recently a video of a middle-aged woman begging the police to let her go to work went viral. She was pleading that her pay will get deducted and she won't have anything to feed her children. What will they eat? Such heart-wrenching scenarios show that the daily wage earners or the piecework paid earners are the hardest hit segment of society. They are already struggling for survival and with the present condition they will die of hunger before death through the disease.

The latest 2018 report of PBS states that the total unemployment rate is 5.7 percent in the country. Sindh has a high rate of youth unemployment, 12.45% (2017-2018). Further breaking it gender wise shows that it is 4.9% for males and 11.9% for females. In 2019 the agriculture sector employed 41.37%, services sector employed 34.96% while the industry employed 23.67% of the workforce.

⁶ Shagufta Shabbar is PhD candidate at Institute of Business Administration, Karachi

⁷ Data from <http://covid.gov.pk/stats/pakistan> and various other sources.

At this time of economic crisis, it is important to see those who have vulnerable employment.⁸ They form the lower income group. The vulnerable employment as measured in 2017-2018 was 55.6%. This high number raises several red flags in the current pandemic. It shows that a huge number may lose their jobs in case of business closures. The hard-hit sectors due to COVID-19 may resort to laying off workers. These sectors include hotels and restaurants (48.6%), Transport and communications (49.4%), real estate and business activities (63.4%), manufacturing (32.9%). Looking provincial wise, in Sindh the share of vulnerable unemployment is 49.5%. Sectoral wise shares are manufacturing has 22.8%, construction has 4.1%, transport and communication has 34.2%, real estate and business activities has 63.9%.

These figures show that vulnerable employment is very high. The wage rates for the Hyderabad, Sukkur and Larkana have remained constant; however, Karachi shows a slight increase in the wage rates of painters and plumbers indicating that many of them have returned to their villages due to the pandemic and the shortage in supply increased their wage rates. But the lockdown will inhibit any accruing of benefits to them. The wages of masons, electricians and laborer have remained constant over the period analyzed. But again, this is of little benefit to these low-income earners as they have been robbed of their livelihood due to the COVID-19 lockdown.

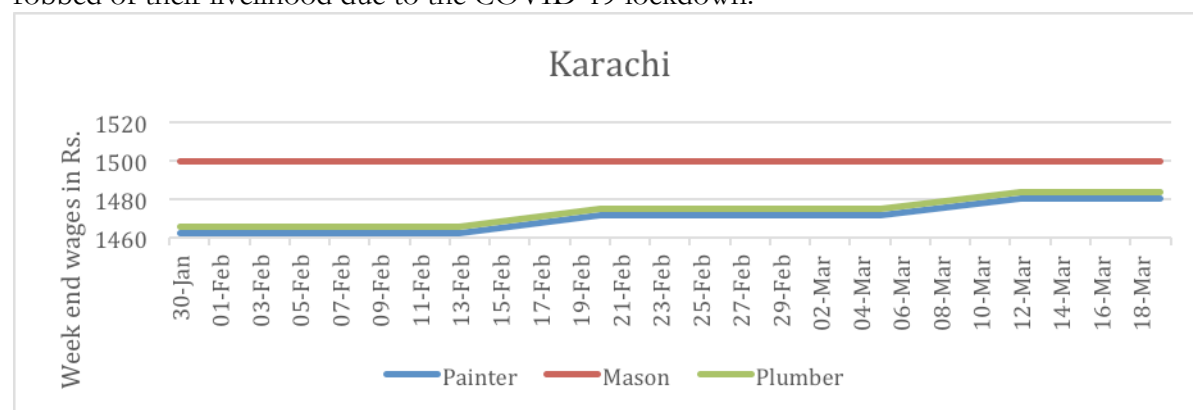


Figure 3. source: Pakistan Bureau of Statistics

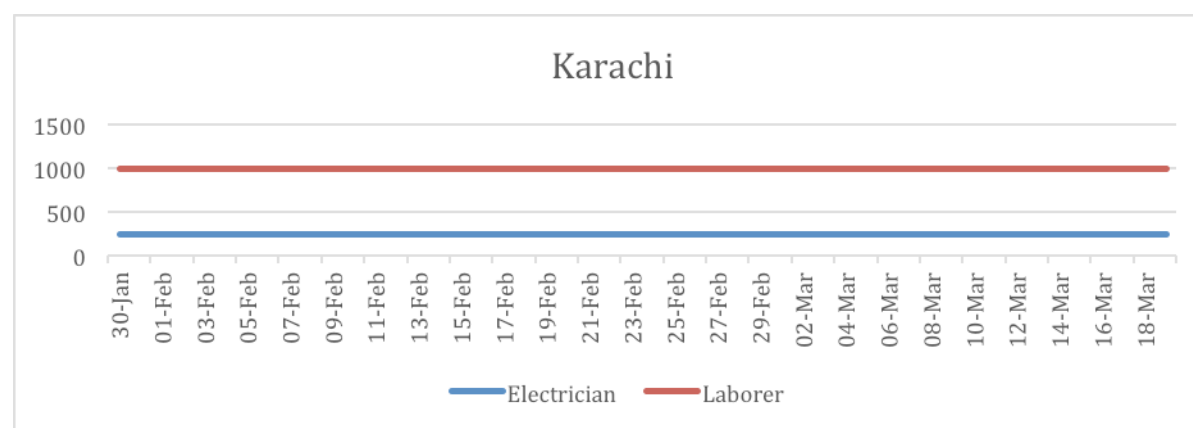


Figure 4. source: Pakistan Bureau of Statistics

⁸ Vulnerable employment is measured as the proportion of own-account workers and contributing family workers in total employment.

<http://www.pbs.gov.pk/sites/default/files/Pakistan%20Employment%20Trend%20%20Reprt%202018%20Final.pdf>

Out of the paid employment in Sindh, the Casual paid employee is 46% and Paid worker by piece rate is 6.2%. This means that 52.2% of the paid employee will have no work during the lockdown. This along with the low statistic of employment-to-population ratio in Sindh i.e. 49%; gives a bleak picture. This may cause rampant poverty in the province as a result of the COVID-19.

To complete the picture of the economic toll, it is necessary to look at the price level in the economy. Although the supply chain has not been that badly affected, the recent hoarding behavior by the people has created supply and demand issues. The high demand has started to show effects on inflated prices of some products. For example, the price of a 200 ml sanitizer bottle has seen an escalation of 200%. Similarly, the Rs. 10 surgical masks are being sold at Rs. 40. Although the government is trying to stop such unreasonably high prices charged by the retailers, the general price level has increased for high demand products. This is causing problems to the poor who have already become more vulnerable due to the COVID-19 lockdown. Food distribution channels have started to face issues due to transport disturbances, but it does not seem to have impacted staple commodities since they are distributed in bulk.

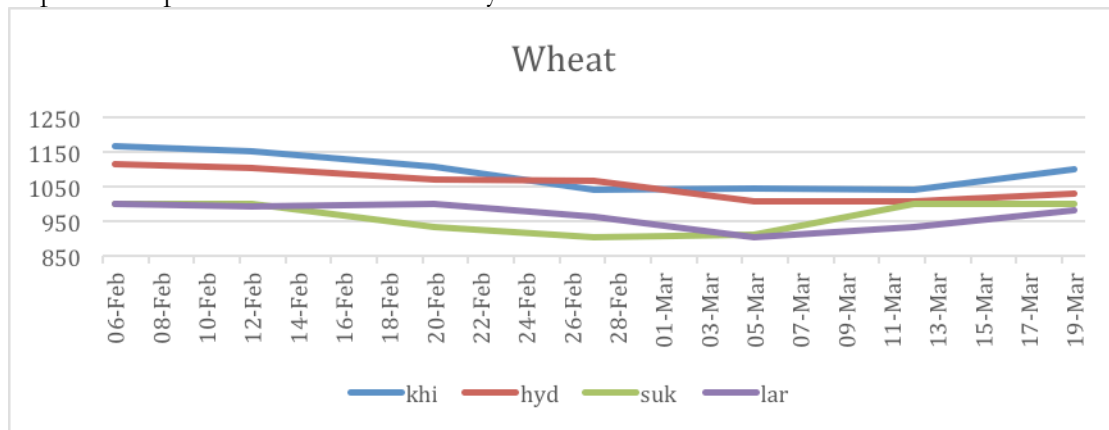


Figure 5. source: Pakistan Bureau of Statistics

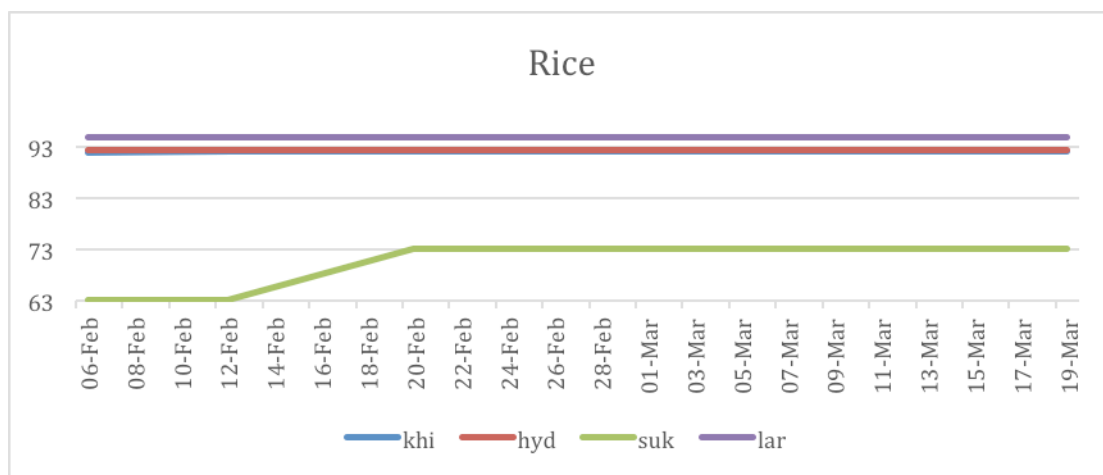


Figure 6. source: Pakistan Bureau of Statistics

The wheat prices have fallen slightly but seem to pick up pace in the last recordings. Rice prices show no impact in any city except Sukkur. However, the milk prices have started to increase in Karachi and Hyderabad. Eggs prices had decreased after the winter season but have again started to show an increasing trend. The reason for a positive trend in both the eggs and milk maybe due to excess consumption to boost immunity against the diseases (as being promoted by media).

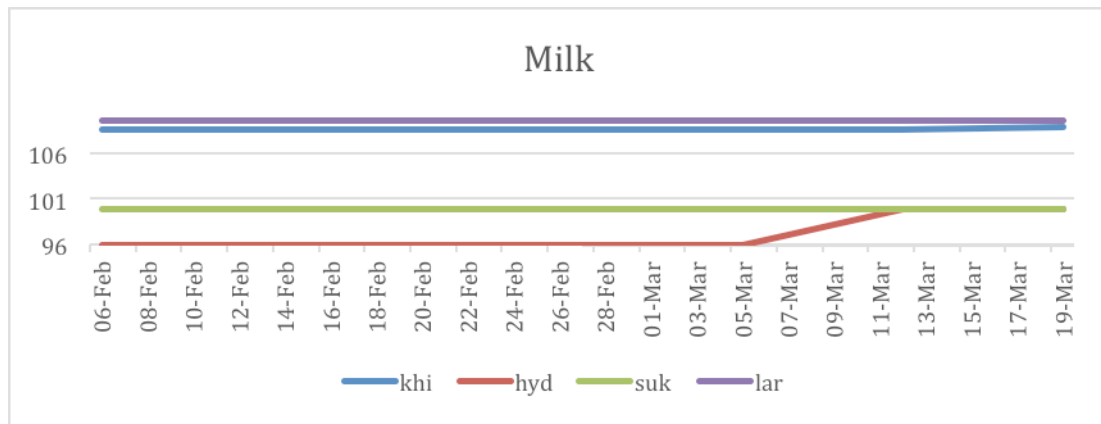


Figure 7. source: Pakistan Bureau of Statistics

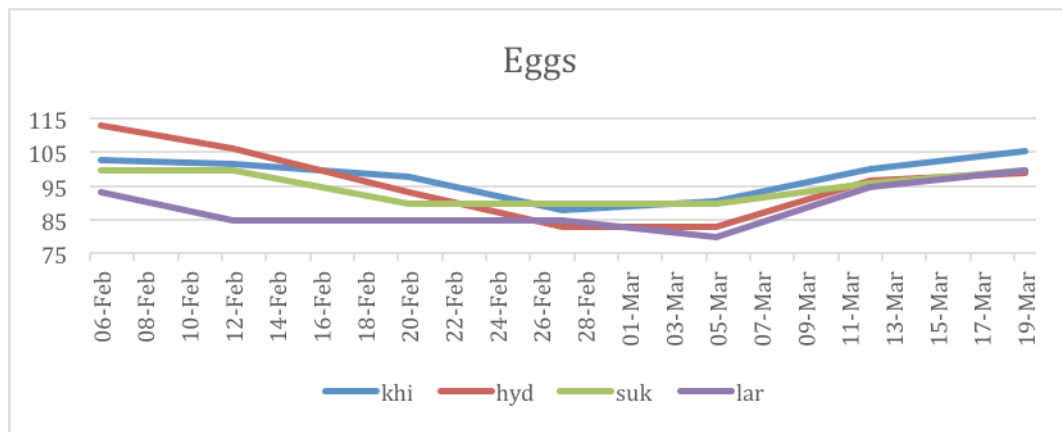


Figure 8. source: Pakistan Bureau of Statistics

The price of vegetable ghee shows a slight increase in Karachi. The price of sugar is showing a general upward trend for all the cities.

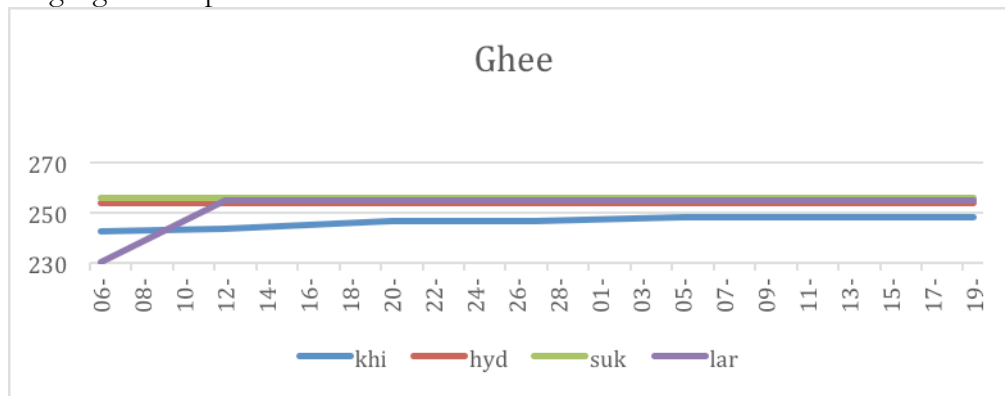


Figure 9. source: Pakistan Bureau of Statistics

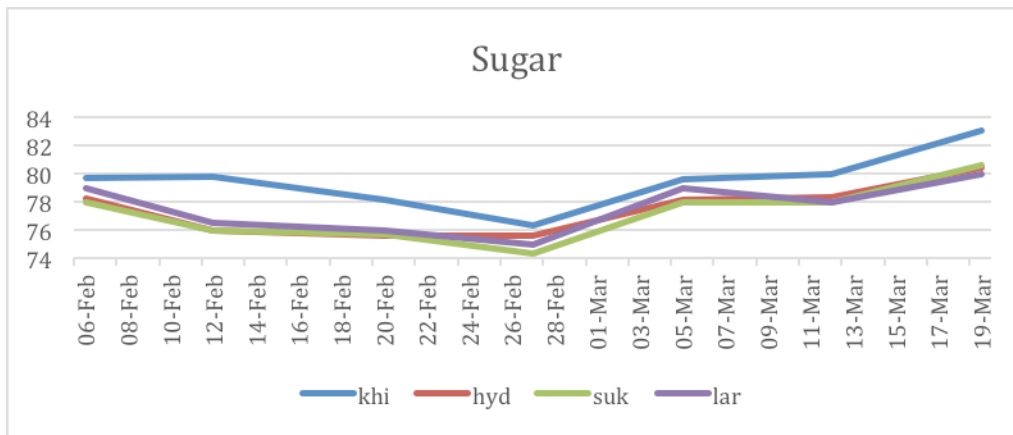


Figure 10. source: Pakistan Bureau of Statistics

Although the price of onion showed an upward trend, it has again started to taper off. However, potatoes have started to see a surge in prices, maybe because it can be stored for a longer period and people have started hoarding it. These price increases will cause a blow to the lower income groups, especially ones who have already lost sources of income.

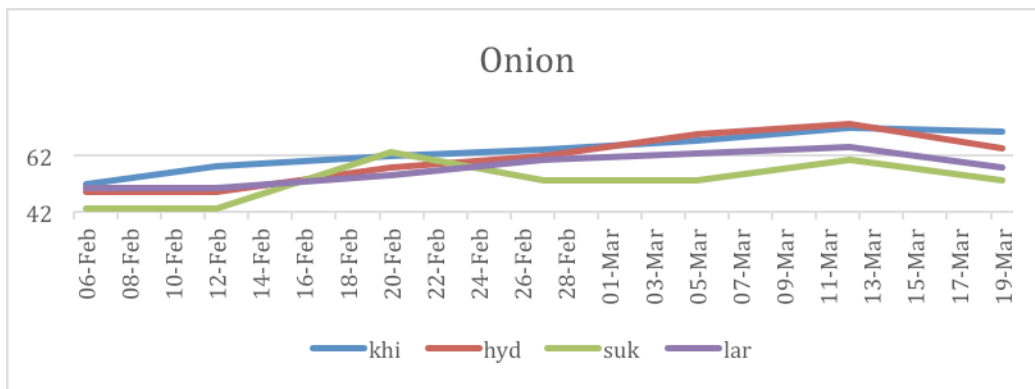


Figure 11. source: Pakistan Bureau of Statistics

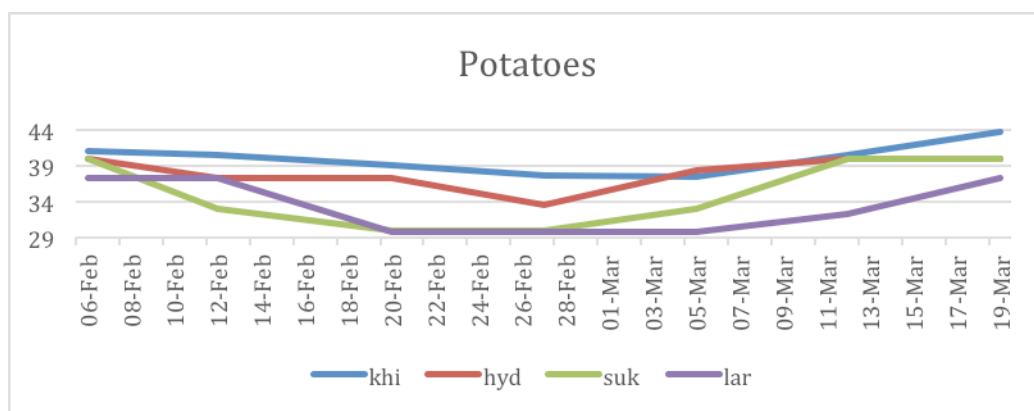


Figure 12. source: Pakistan Bureau of Statistics

The prices of daals, such as mash, moong and masoor, have shown a downward trend in prices. These daals form a major composition of a poor man's diet and thus it may help curb, a little, the brunt of losing source of income due to COVID-19.

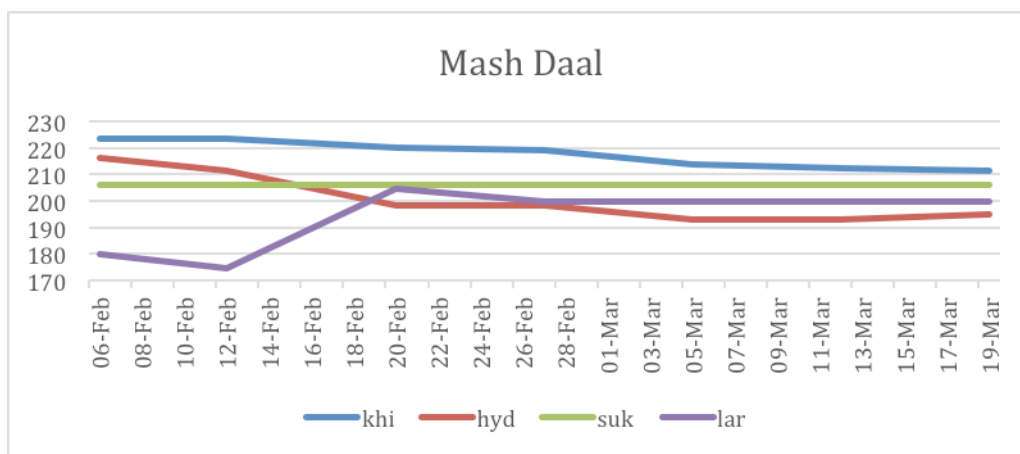


Figure 13. source: Pakistan Bureau of Statistics

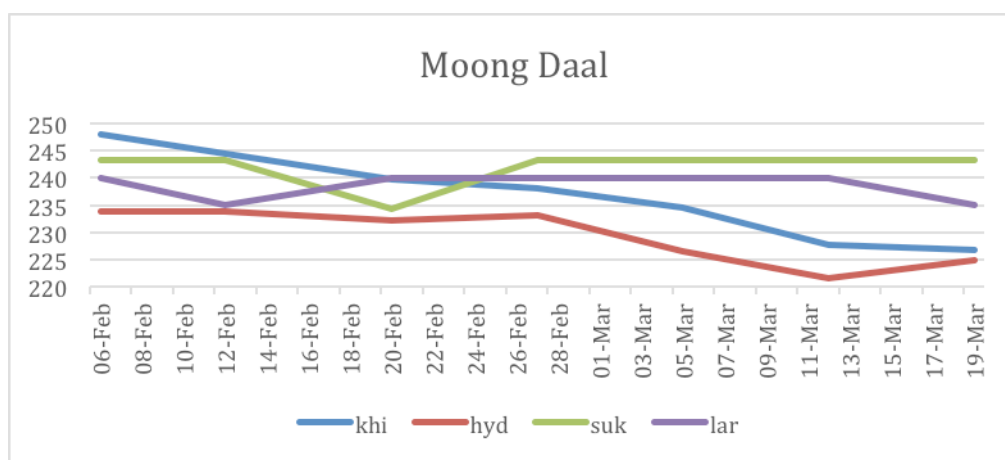


Figure 14. source: Pakistan Bureau of Statistics

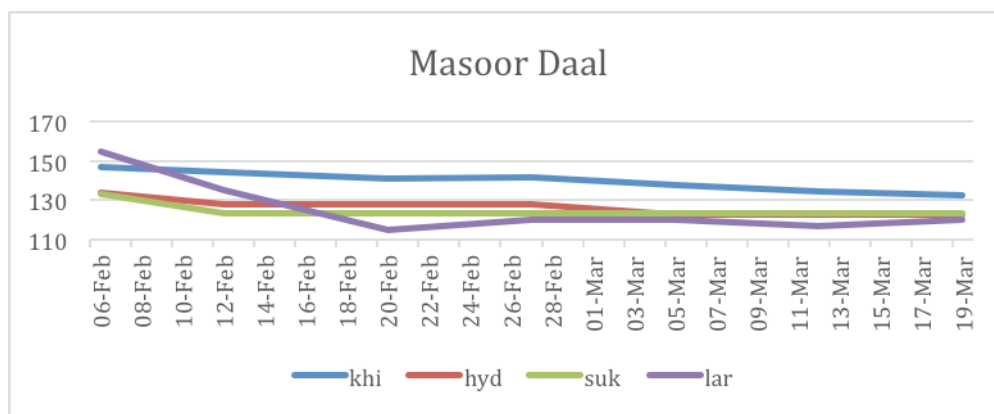


Figure 15. source: Pakistan Bureau of Statistics

It is estimated that there will be a 1.4% decline globally in labor productivity and the total factor productivity shock to the world GDP will be 1%.⁹ The latest study conducted by IFPRI shows that the developing countries may suffer an almost 25% decrease in food export, even though demand for food is income inelastic. It is expected, that in South Asia there will be an increase in the number of people under the poverty line by 2.1% as a result of the total factor productivity shock.

⁹ <https://www.ifpri.org/blog/how-much-will-global-poverty-increase-because-covid-19>

The global recession has caused the price of gold per gram to fall over the one-month period i.e. from Rs 8,156.44 on 21st Feb to Rs. 7,666.93 on 22 March 2020. The demand for cash has surged due to the pandemic as people have increased cash hoarding. The global oil price has fallen too. It fell by around 30% due to the falling demand. This may prove helpful for the economy as our import bills will see a decline, since 26% of imports is oil price driven. This will have a favorable impact on the balance of payments. If the government passes the entire decrease to the consumers, it may alleviate some miseries, but it seems unlikely as the government may want to use it to reduce the circular debt. On the other hand, both the downward trend in gold and oil will help decrease inflation in the country which had started to become quite uncontrollable before the pandemic. This may prove favorable especially for the lower income groups.

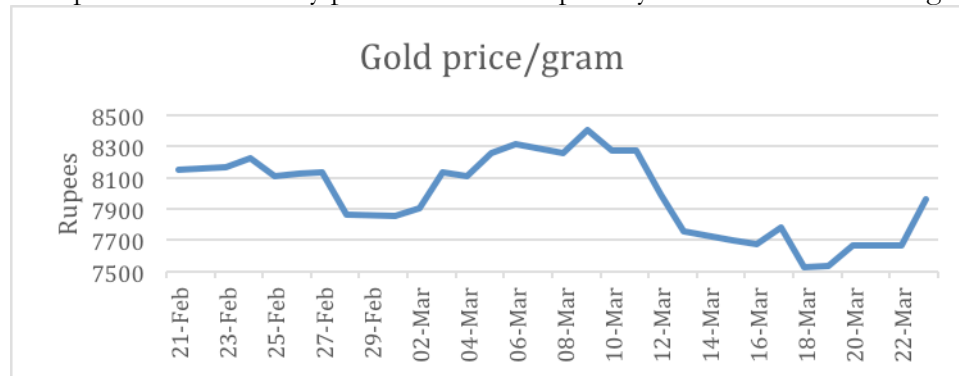


Figure 16. source: Bullion rates

It is expected that the SMEs in Pakistan will face cash constraints and may head towards bankruptcies. The supply chain will be affected with less labor and lower consumer demand for income elastic products. Exporters will suffer the most since their shipments are stuck at ports and there is low global demand.

Changing Environment in Karachi During Pandemic Spread of COVID-19

Asim Bashir Khan¹⁰

The world is passing through most turbulent times in wake of the pandemic coronavirus outbreak. With the increasing number of patients and suspected cases, the situation across Pakistan is deteriorating, given the context of insufficient health facilities and resources.

Learning from international experience, the federal and provincial governments have decided a full lockdown in the country. As a result, not only routine livelihood of masses is disturbed, but the situation has led to closure of economic activity.

As the literature suggests, economic activity, specifically industrial production, is directly associated with carbon emissions, environmental degradation which is often measured through Air Quality Index (AQI). The AQI of major cities in Pakistan is improving post immense lock down. This scope of present analysis is restricted to Karachi the largest city and industrial hub of Karachi.

The city has six districts with a population of 16.054 million¹¹ (2.36 million households) spread over an area of 3,648 Sq. Kms. The means population density is about 14,791 person per Sq. Km. The city has two ports and hub of large-scale manufacturing. It is ranked [29 out of 52](#) most polluted cities in the world.

The change in AQI is the best proxy for valuation of quality of environment. The individual Air Pollutant correspond to $PM_{2.5}$ which refers to concentration of particulate matter of 2.5 microns. These are very tiny particles reduces the visibility and when their concentration is increased, make air to be appear as hazy. For an overall AQI is calculated after incorporating the concentration of particulate matters of various size and monitoring of ozone levels etc.

$$AQI = \max(AQI_{PM_{2.5}}, AQI_{PM_{10}}, AQI_{PM_{10}})$$

US Environmental Protection Agency (EPA) regularly publishes the real time historical data 'Pakistan Air Quality Monitor' which reveals important insights about the quality of air, potential health hazards. This paper is considering daily API value corresponds to concentration of $PM_{2.5}$ only.

The Table 1 below presents details of AQI value, corresponding air pollution level, health implications for the society. Karachi being economic and financial hub of the country facing rapid environmental degradation over time. Due to industrial waste of industries the two major rivers¹² of Karachi are merely effluent disposal channels, so is the bad condition of air quality, dust and haze.

¹⁰ Asim Bashir Khan is a PhD candidate at Institute of Business Administration, Karachi.

¹¹ Population Census 2017

¹² River Layari, River Malir

Table 1. Air Quality Index Scale and Color Legend (US-EPA 2016 Standard)

AQI	Air Pollution Level	Health Implications	Cautionary Statement (for PM2.5)
0-50	Good	Air quality is considered satisfactory, and air pollution poses little or no risk	None
51-100	Moderate	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.	Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
101-150	Unhealthy for Sensitive Groups	Members of sensitive groups may experience health effects. The general public is not likely to be affected.	Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
151-200	Unhealthy	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects	Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion
201-300	Very Unhealthy	Health warnings of emergency conditions. The entire population is more likely to be affected.	Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.
300 +	Hazardous	Health alert: everyone may experience more serious health effects	Everyone should avoid all outdoor exertion

Source: <https://aqicn.org/scale/> Accessed March 23, 2020.

Figure 1. Karachi Air Quality Index Summary 2020 and 2019



Source: <https://aqicn.org/map/karachi/> Accessed March 23, 2020

Post COVID-19 Lock Down Situation of Environmental Index and Air Borne Pollutants Concentration in Karachi

Figure 1 above presents a comprehensive summary of AQI and corresponding legend of Air pollution levels which shows that post COVID-19 lock down. The AQI index of post lock down in Karachi has significantly improved and lies in a region, which is classified as GOOD AQI index with least pollution.

What is even more interesting, is that there are 30 days with similar AQI values between days from June 2019 to October 2019, although the city was never locked down. Post the COVID-19 episode, there are 4 days with moderate AQI values, however, there are 71 days with almost similar value of AQI in between May 2019 to December 2019.

There can be many reasons, but the two important reasons can be (i) monsoon rains and (ii) industrial slow down and layoffs by many large companies and corporations.

As we are aware that industrial production/economic activity has direct link with environmental degradation, so the above results are corroborating the evidence on ground the negative growth of 8 percent in large scale manufacturing¹³.

Albeit such lockdowns have negative impact on the economy and growth, yet its impact on environment has important insights to offer.

- Environmental degradation and poor air quality in Karachi has direct link with industrial production.

¹³ <https://www.arabnews.pk/node/1606506/pakistan>

- We do have the Sindh Environmental Protection Agency but unfortunately there is no public policy for abatement against pollution damages.
- Pollution has a societal cost which is transferred from one generation to the other
- Abatement is not a free lunch, government certainly needs money, therefore, the government should design a plan and implement an anti-pollution policy including reduction in carbon emission, carbon tax, carbon permits, market-based instruments etc.
- Industrial production

The COVID-19 pandemic is one the painful episode for entire humanity. Lockdowns are not good, but is the need of the hour. Post lockdown AQI shows and the AQI of 2019 offer important insight about pollution and the level of economic activity. It is therefore recommended that the Government of Sindh should adopt an aggressive anti-pollution policy, to offset the effects of industrial pollution with timely public abatement efforts.

Pakistan Stock Market Reaction to Covid-19

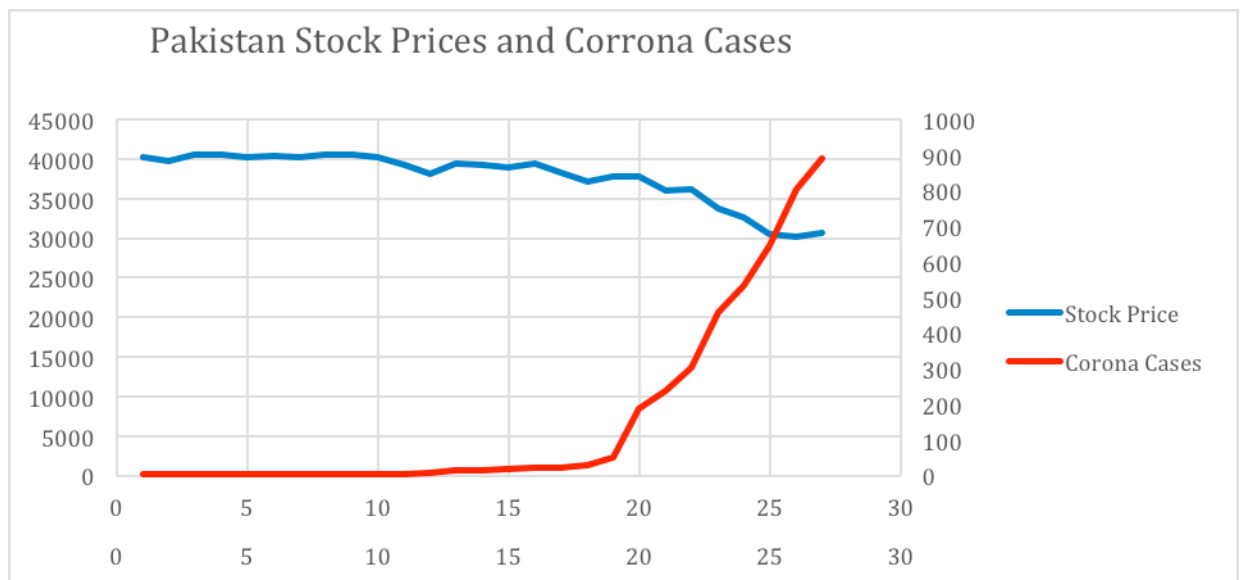
Hamid Hussain¹⁴

The COVID-19 outbreak could go down as a significant illustration of an overlooked danger in history. Much of the concern of corporate decision-makers and policymakers has centered on mainstream market risk outlets and the urgent climate change problem. Major personal life disturbances are happening, for example curfew-like situations in Pakistan and in other countries. Besides the acute disasters of death and illness, there is pervasive apprehension (leading, for instance, to mass purchase of daily goods). The potential economic influence of COVID-19 remains somewhat unpredictable, as it is not clear regarding the propagation of the epidemic, its extent and mortality rate, the policy responses and human behavior.

Economists anticipate the COVID-19 to reduce global economic development by about 0.15 percentage points in 2020, translated into about \$135 billion in postponed or unproduced products and services. This year's effects would be guided by three things: first, how quickly the virus travels and how long it lasts; secondly, how much concern affects travel, consumer buying, production, and trade; and finally what steps policymakers take to avoid the spread of the virus and improve productivity.

In this case, the equity market provides a beneficial opportunity to examine, which companies find creditors to be especially impacted by the direct and indirect consequences of the virus outbreak and which companies may not be impaired. In this way, the equity exchange offers a constantly monitored and welcomed overview of what the markets think may eventually be the economic effect of the epidemic.

Figure 1 Pakistan Stock Price Index and COVID-19 Cases



Following the global trends, Pakistan Stock Exchange (PSX) also began trading on a bearish note, with the benchmark KSE-100 Index recording its biggest fall since 2009.

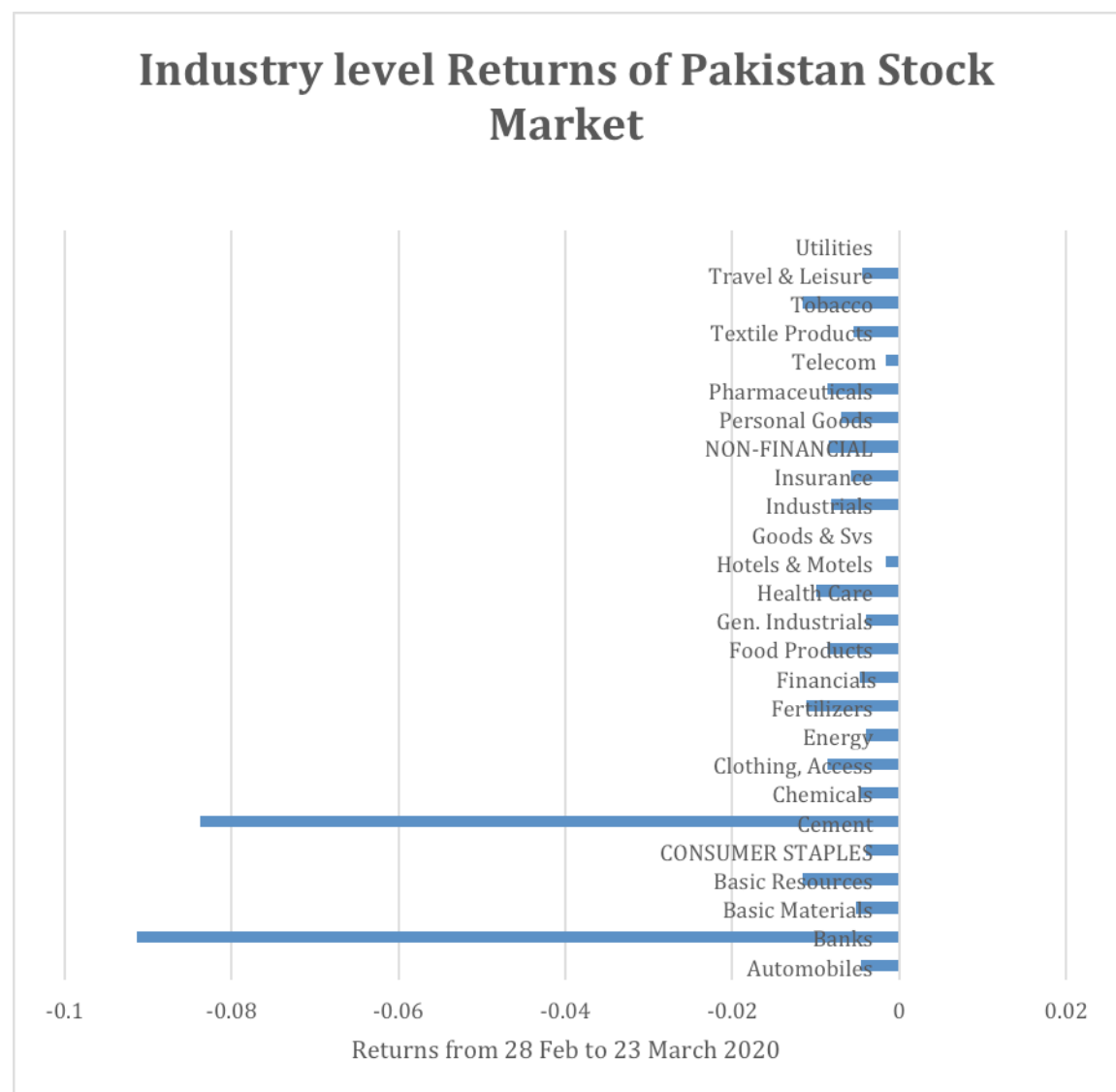
¹⁴ Hamid Hussain is a PhD candidate at Institute of Business Administration, Karachi.

Due to the increase in the number of COVID-19 cases in the country, the KSE-100 Index lost 1336.03 percentage drop of 4.68 and touch to intraday low at 27228.80 points

Time Trends in Industry level Returns:

Many businesses just might endure the crisis, while a few might even profit, and clearly, many sectors will suffer greatly. The types of examples include transportation, leisure, hoteling and airlines, which will be definite losers, and home distribution providers as possible winners as will be facemask manufacturers.

Figure 2 Industry level Returns of Pakistan Stock Market



The unfavorable raw returns generated by all companies but one (Goods and Services) Second, Power, Transportation, Chemical, Banks and Automobiles suffered especially throughout the last one-month. The petroleum market, for example, is made up of several oil firms that will fail in a crisis, and transport corporations are reducing both human traffic and transportation. Companies related to the medical filed have been clear

winner in other countries but not in Pakistan. The Goods and Services and utility sectors are the only sectors in Pakistan, which performed well as compared to other industries, as demand for facilities that help jobs at home have skyrocketed. Utilities have benefited significantly, probably because these companies, which are largely local, depend less on foreign markets and competition. In addition, utilities stocks may benefit from “flight to safety” trading in case of recession fears. Although our focus in this paper is on the Pakistan stock market, it is interesting that, by and large, a similar pattern may be seen in rest of other developing economies.