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THE IMPACT OF COVID-19 OUTBREAK ON CHINA SECTORAL INDICES IN SHORT AND MEDIUM RUN

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ABSTRACT
The novel coronavirus COVID-19 has severe consequences for countries around the globe. The purpose of this study to find out the impact of COVID-19 on China's sectoral indices in the short and medium run. This research investigates the impact of COVID-19 on stock exchange index, exchange rates, money lending, and oil prices in the Chinese economy in the short and medium run by using secondary data of different sectoral sectors. The outcomes show that COVID-19 has strongly influenced these sectors. The Shanghai stock exchange is showing a decline in transactions due to this pandemic in the short run. But in the medium run, the outcome shown that Shanghai stock exchange has upward trend. The pandemic has reduced exchange rate of Chinese RMB to US dollar in short-run, but in medium run, Chinese RMB has gained appreciation against US dollar. The money lending for medium enterprises is showing downward curve. Result shows that money lending rate has reduced from 3.25% to 3.10% in the short-run and 2.95% in medium run. Overall, pandemic has had significant influence on the Chinese economy and development.

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INTRODUCTION

A novel coronavirus later named COVID-19, which produces respiratory illness with pneumonia -like symptoms, received global attention in December 2019 (Committee, 2019). It affects human respiratory system causing severe conditions that results in death of those afflicted. In December 2019, this new coronavirus emerged in city of Wuhan in Hubei province, China. By 23rd Nov 2020, the total number of infected people worldwide was more than 58,425,681, and the death toll was more than 1,385,218 (WHO, 2020). In China alone, about 90,000 people were infected, and more than 4,000 were declared dead by this novel coronavirus. Most of the infected people in China had the recent travel history, including Wuhan, known as the epicenter of this novel

coronavirus. The Wuhan Health Organization stated that COVID-19 could be transmitted from human to human. The virus spread to more than 180 countries of the world, and WHO declared this as a pandemic on 11th March 2020. The fatality rate of the coronavirus is about 2% to 3%, which is less than the two other major respiratory diseases that have struck the world in the last 20 years.

For Middle East Respiratory Syndrome (MERS), the fatality rate was 34%, and for Severe Acute Respiratory Syndrome (SARS), about 10%. The virus's incubation period may range from 2 to 14 days (WHO: NHC, 2020). The human transmission rate is very high, and due to this, millions of people have become infected by COVID-19 around the world. The virus can infect all groups of the population, but older people and people having pre-existing medical diseases are typically made more ill by this virus (Organization, 2009; Sun, Chen & Viboud, 2020). COVID-19 is not only affecting the health of the individuals in the countries; it also has an impact on the social, economic, and financial position of every country in world. COVID-19 is highly transferrable from human to human (WHO, 2020), so majority of China's population was restricted to their homes by the Chinese government. All the shopping centers and manufacturing units in China were closed for many days, and we can say that there has been less commercial activity for the months, so commercial losses are increasing. Due to this novel coronavirus, the stock markets of different countries have crashed, and oil prices in the world are lowest in forty years (Prices, 2020).

We can say that the world is facing new financial crises, just as it did in 2008, and all sectors of economies in the world are being affected, including stock prices and oil prices. Put simply, everything in the world is affected by coronavirus. Local and international trade between cities and countries has been stopped due to this outbreak that affects every national economy negatively, and many enterprises face business failure. As result of these restrictions, an economic decline has been seen in the stock exchanges of China since this outbreak began, a decline that "which has never happened before." The COVID-19 epidemic brought socio-economic crises around the world. Various researchers and economists predicted that consequences of this epidemic on the world economy would be more severe than the 2007-08 global financial crisis (Ramelli and Wagner, 2020). The current study is intended to discuss the immediate and early consequences of this worldwide pandemic on various sectors of the Chinese economy, including oil prices, medium lending financing, transportation, exchange rate, and stock index. Consequently, this study will help other countries to take necessary steps to cope with COVID-19 situation in the country.

Figure 1a

Short run Jan 2020–April 2020, World Health Organization

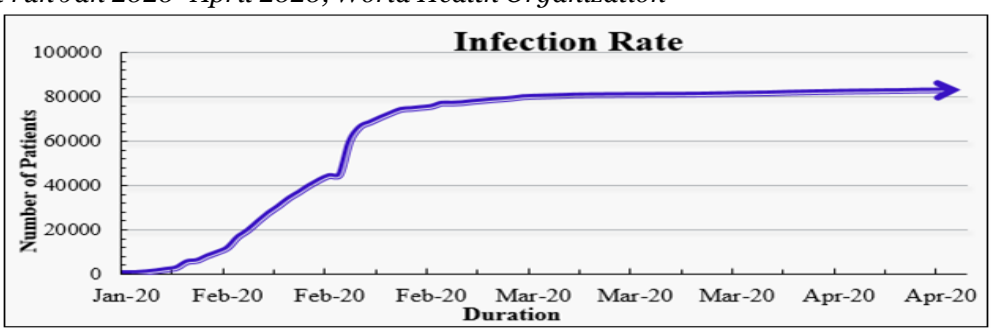


Figure 1b
Medium- run Jan 2020–September 2020, World Health Organization

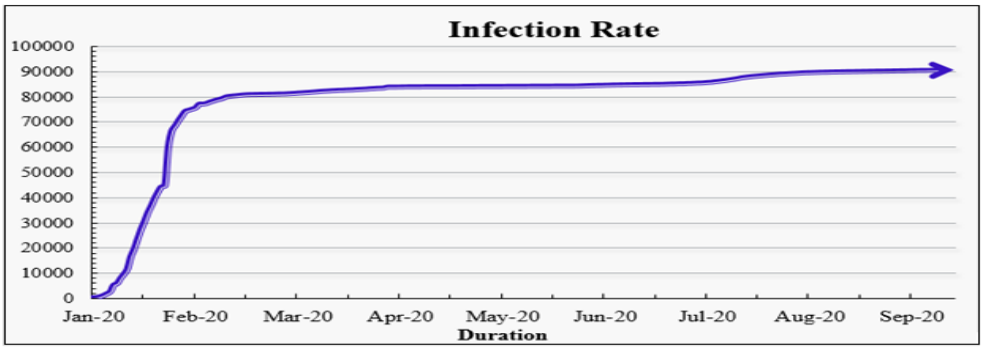


Figure 1a shows the total numbers of COVID-19 patients in China in short-run; at the start of the outbreak, the infection rate was very high, but with help of lockdowns and strict policies, the government of China controlled the transmission of the virus resulted in a low infection rate Figure 1b. The graphs show rapid increase of COVID-19 patients from late January to April, but the infection rate was under control after April. The government of China continues to take serious steps to stop the spreading of this virus, including locking down cities, ordering people to avoid gatherings, and stopping mass celebrations of annual and spring festivals in country. Social distancing plays a key role in controlling transmission of the virus. The main objective of social distancing is to avoid social contact transmission rates. The economic cost of COVID-19 is very clearly mainly due to social distancing, and the high economic cost raises the question of whether social distancing is worth the cost (Hilsenrath & Armour, 2020; Khan, Khan & Siddique, 2021).

In China, many manufacturing units have not been working since late January and government has invested billions of dollars in stopping and controlling the virus. Despite these efforts taken by the Chinese government, this outbreak affects not only economy of China but also economy of the whole world, which is experiencing a recession due to this outbreak. The social distancing plays a key role in controlling the transmission of the virus. The oil prices at the international level fell to 31 dollars per barrel in March, which has never been happened before. A lot of stock exchanges show a decline in their business. This paper investigates the effect of the epidemic on different sectors of China's economy, such as the stock exchange index, exchange rate, oil prices, medium-term financing, and transportation in the short and medium run. The study analyzes how these sectors responded to this epidemic during the first few months of the said pandemic.

LITERATURE REVIEW

China and the whole world have faced influenza and pandemics since ancient times. They have affected millions of people in China and around the world because of the widespread human to human transmission. Such pandemics cause panic in humans due to death, illness, and social limitations. The studies show that pandemics result from human development and changes in nature (Kuszewski & Brydak, 2000). Now, unlike ancient times, development of technologies and other resources allow humanity to control, stop, and even prevent the wide spreading of

such diseases. However, if these measurements are not taken in time, then it will difficult to control the spread of the transmission. The Spanish flu occurred from 1918 to 1920 and caused more than forty to fifty million deaths (Waring, 1964). The Asian flu occurred from 1957 to 1958 and resulted in about one million deaths (Pyle, 1986). In this connection, about ten years later, Hong Kong influenza disaster occurred from 1968 to 1970 (Reperant, Moesker, and Osterhaus, 2016). Consequently, the result of Hong Kong's flu was about two million deaths. The swine flu occurred in 2009 to 2010 and caused death of almost 600,000 people as it spread worldwide (Guan et al., 2010). Thus, SARS occurred in 2003, killing 800 people and infecting more than 8,000.

According to the United Nations Academy of Sciences, across the globe, annual economic loss from epidemics is about sixty billion dollars. Influenza pandemics are primary cause of epidemics, and because influenza is wide-spreading and challenging to control, it is a challenge to human health and economic development. As a result of current COVID-19 influenza, global economic loss is more than three trillion dollars. The GDP loss due to major global epidemics may exceed $3.5 trillion (Burns, Mensbrugghe & Timmer, 2006). Fan, Jamison and Summers (2016) stated that epidemic economic loss might be high as $570 billion. Other researchers have different estimates for different epidemic financial losses to policy and regulations made by government to control and prevent the economic loss and save human lives. Bank (2018) divided economic losses into diverse categories due to epidemics; for example, one category is lack of production capacity of industries due to an incapacitated labor force. The government is concerned with health of citizens and prevention measures are taken to stop spread of disease; unfortunately, this has resulted in more people becoming unemployed. For example, statistics show that more than 3.2 million people in USA have applied for unemployment allowance so far due to current outbreak.

Impact of COVID-19 on Oil Prices

Since COVID-19 broke out, the majority of production units in world have not been working. As a result of this, the oil prices at international level are the lowest they have been for last many years. The price trend is going down since the outbreak, and the lowest price was 23 dollars per barrel in March (Economic, 2020). The negative effect on oil prices was triggered because the majority of countries are in a lockdown situation and trying to control prevalence and spread of the virus. The prevailing epidemic led to oil price shock across the world as the demand for oil was reduced due to lockdown, but production and supply of oil remained constant from the oil-producing countries (Sharif, Aloui & Yarovaya, 2020). Albulescu (2020) concluded from his finding that COVID-19 has a negative impact on oil prices. Moreover, production disagreement between major oil-producing countries was the main factor in a lower price per barrel. The difference between supply and demand resulted in lowering price (Prabheesh, Padhan & Garg, 2020).

In the case of China, the oil prices have gone down because the majority of the production units and transportation are locked down to prevent the spreading of the novel coronavirus. Due to this pandemic, the price of oil fell suddenly. At the start of 2020, it was almost 2460 RMB per ton Figure 2a, but due to outbreak in China and throughout the world, price fall to 1016 RMB per ton on 20th April 2020, as shown in the following figure 2b. Figure 2b displays production disagreement between different countries that resulted in low oil prices in history. In this regard, this is what happened with Covid-19; the governments of many countries gave little attention to stopping its spread, and now almost every country has cases. In this connection, both graphs

portray that future oil prices fall rapidly in the short run, but in the medium run, the prices are between 2000 to 1600 in August to September, but prices are much lower as it was in January, 2020.

Figure 2a
Short-run impact Jan 2020–April 2020, Shanghai Future Exchange Rate

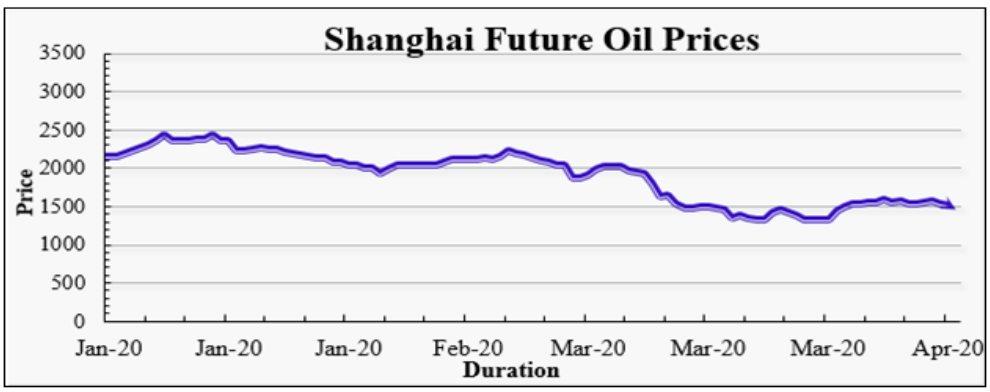
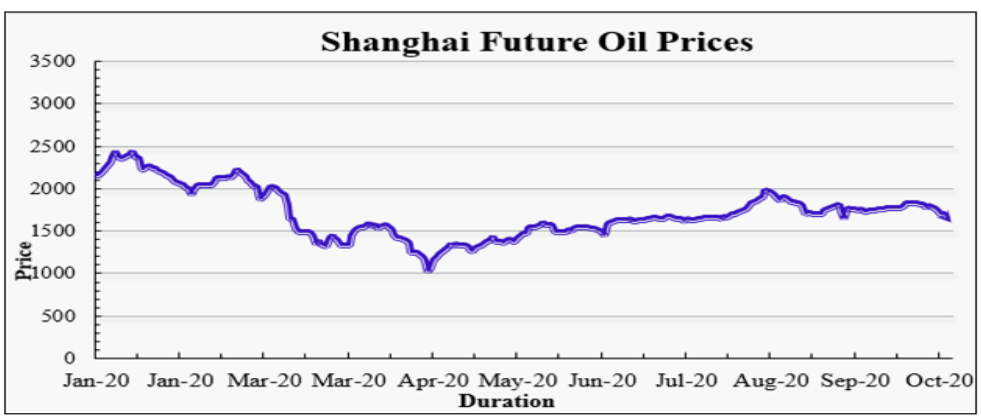


Figure 2b
Medium run impact Jan 2020–October 2020, Shanghai Future Exchange Rate



Impact of COVID-19 on Medium Lending Financing

The main problem in the growth and development of an organization is its financing activities, which have major impact on its production and growth (Brault, Signore & Note, 2020). Access to finance is the primary factor that affects firm's growth, especially in medium and large firms (Weng, 2016). At the same time, Hoseini and Beck (2020) stated that loans are important for organization to meet its requirements. No company is adequate in funding, so organizations rely on external sources for funding to meet their business requirements. In China, majority of businesses rely on external source of financing. Due to availability of limited data, we consider medium lending financing, which shows a decline in borrowing for business financing during this pandemic period. Due to this outbreak in China, the demand for lending has decreased to

some extent due to no production and no business activities, so we can say that this epidemic decreases the demand for medium-term financing to run operations, so it has affected the gross domestic product of China. Effect of COVID-19 pandemic on whole medium lending financing situation for SMEs is shown in figure 3b, which portrays that government of China has reduced the medium lending rate from 3.25 to 2.95 to meet the requirements of organizations. In the short run, China's government has reduced the lending rate from 3.25 to 3.10, and in medium run, they further reduced it to 2.95 to support their financial needs Figure 3b. The graph shows that government has taken an incentive to meet the SMEs' demands and help them out in the crisis.

Figure 3a
Short-run impact Jan 2020–April 2020, The People's Bank of China

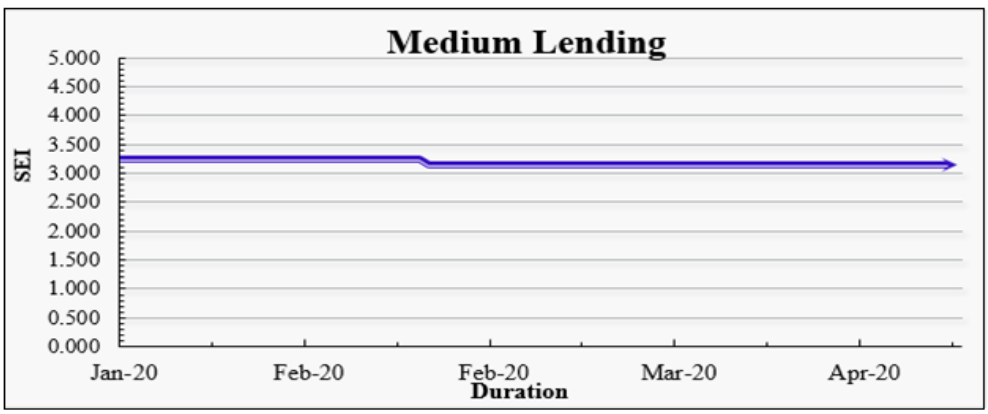
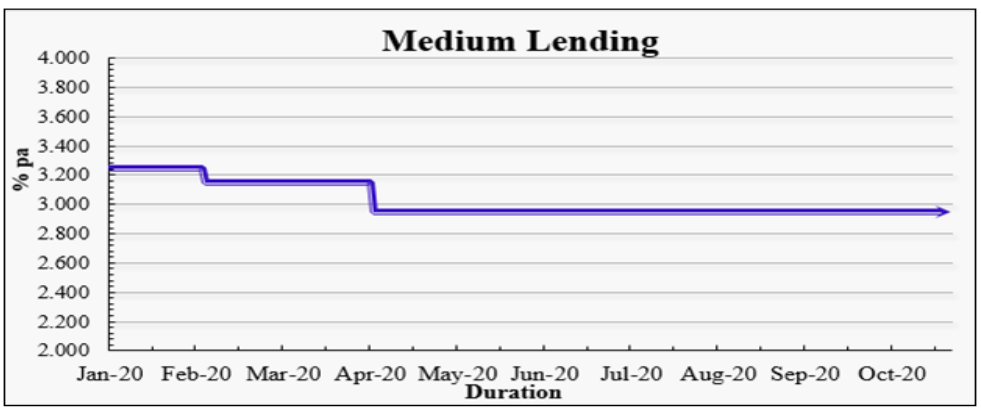


Figure 3b
Medium run impact Jan 2020–October 2020, The People's Bank of China



Impact of COVID-19 on Exchange Rate
The novel coronavirus is now spread all over the world, challenging the health system of each country but also hurting the financial position of each country: almost every country is facing an economic recession. This financial recession is even tougher for the countries with the weak

financial position, and now they are facing not only health problems but also difficult financial problem: their currency's exchange rate is going down (Njindan Iyke, 2020). Iqbal et al. (2020) stated that COVID-19 has the negative impact on the exchange rate. In the case of China, the exchange rate does not vary much because of the strong financial position of China, but still, at the start of the pandemic, the Chinese RMB showed the deprecation against the US dollar in short-run while in medium run Chinese RMB showed appreciation against US dollars Figure 4b.

Figure 4A
Short-run, Jan 2020–April 2020, China Foreign Exchange Trading Center

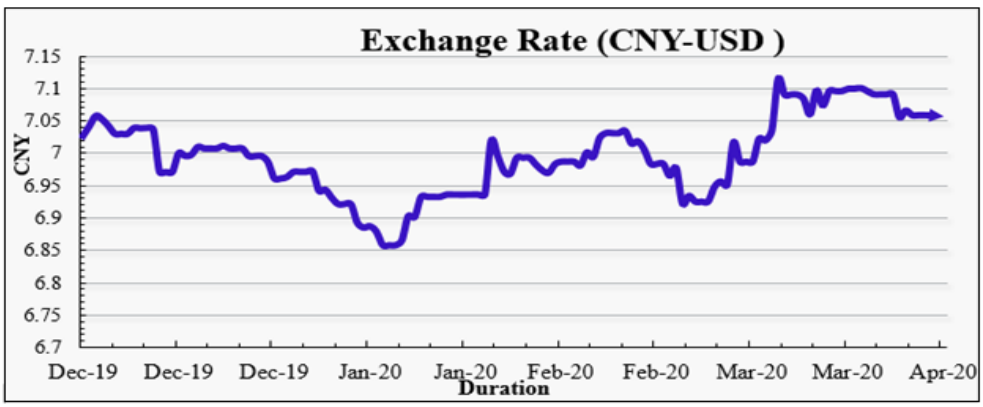
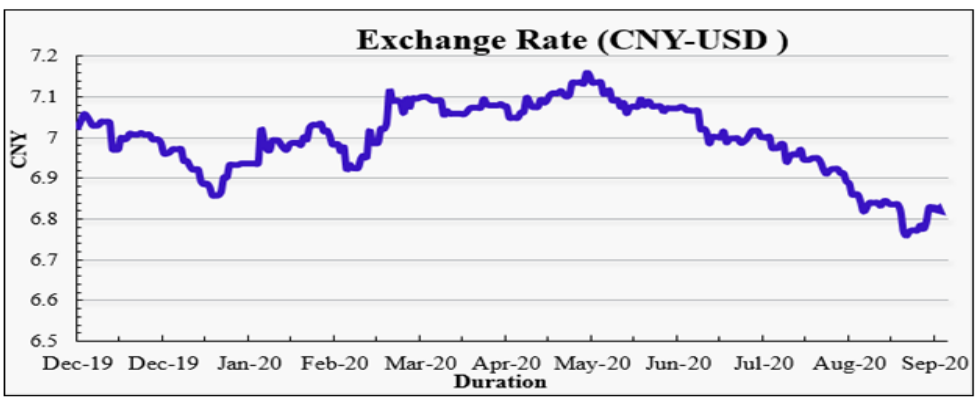


Figure 4b
Medium- run impact, Jan 2020–September 2020. China Foreign Exchange Trading Center



Impact of COVID-19 on Stock Index
Covid-19 has greatly impacted stock markets, causing dramatic variations. At the start of a pandemic, the overall stock market was affected badly (Topcu & Gulal, 2020). Kowalewski & Śpiewanowski (2020) have analyzed association between pandemics and stock exchanges, and their findings showed strong response of stock exchange markets to natural pandemics. In this study, we take the overall business of stock index as a measure due to availability of data. The

Shanghai stock exchange showed change in business and experienced downfall in early February 2020. Figure 5a in the short-run, Shanghai stock exchange showed a downward trend due to worse pandemic situation in China. And figure 5b shows that pandemic was under control in China, then Shanghai Stock exchange showed upward and steady business activities. Comparing both short and medium run, outcome shows that Shanghai stock exchange was effected in Short-run, but it medium run Shanghai stock exchange showed normal business activities in final part of period.

Figure 5a
Short-run impact Jan 2020–April 2020, Shanghai Stock Exchange

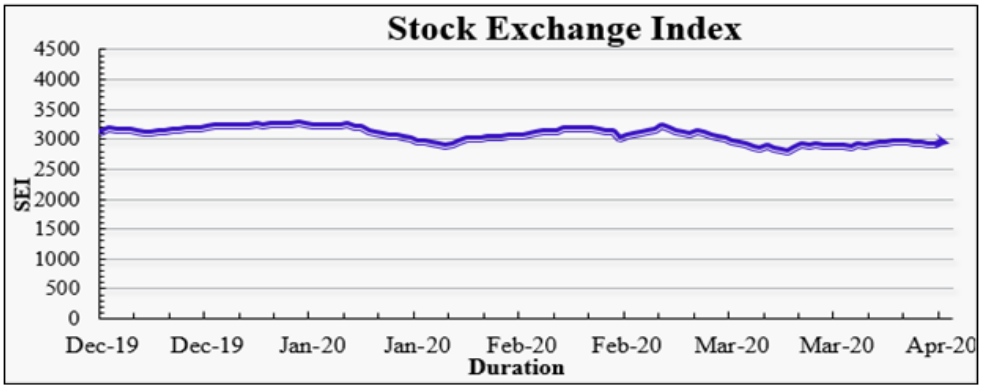


Figure 5b
Medium-term impact Jan 2020–October 2020, Shanghai Stock Exchange

METHODOLOGY

This study used the secondary data on daily basis from January 2020 to September 2020. The COVID-19 patient's data were obtained from the World Health Organization daily reports, oil prices (RMB prices per ton) are obtained from the Shanghai future oil prices, medium lending financing data is obtained from the People's bank of China, exchange RMB rate is obtained from China Foreign Exchange Trading Center) while stock index data is obtained from the Shanghai

Stock exchange. The descriptive statistics has done to study the overall nature of the data while correlation and regression analysis to understand relationship and impact between research variables.

Descriptive Statistics

Table 1 shows descriptive statistics of the research variables. The total number of observations are 253. COVID-19 variable having SD of 19649.57 with minimum and maximum value of 548 and 90545 respectively. Similarly, variable oil prices have (S.D=268.75, M =1657.60), for stock exchange index mean value is 3184.20 while standard deviation is 237.60. The S.D and M for medium financing and RMB exchange rate are (S.D=0.1129, M=3.02 and S.D=0.12, M=6.97) respectively.

Table 1

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
COVID-19	253	78860.6	19649.57	548	90545
OP	253	1657.601	268.7484	1016	2265
SEI	253	3184.209	237.6051	2787	3617
MLF	253	3.027866	0.112969	2.95	3.25
ER	253	6.974281	0.129687	6.6553	7.1588

OP= Oil prices, SEI= Stock Exchange indices, MF= Medium lending financing, ER= RMB exchange rate

Correlation Matrix

Table 2 shows the correlation matrix between research variables. Correlation between oil prices, medium financing and COVID-19 is negative. While the correlation between stock indices and dependent variables is positive that shows strong financial positions of Chinese economy at start of pandemic it shows downward trend but with passage of time it moves again in right direction. While ER of RMB to US dollar moves upward confirming that US dollar strong hold in financial markets.

Table 2

Correlation Matrix

	Patients	Oil prices	SEI	Financing	Exchange rate
COVID-19	1				
OP	-0.5251	1			
SEI	0.3027	0.3323	1		
MLF	-0.6892	0.5263	-0.4867	1	
ER	0.7199	-0.5598	0.4111	-0.9043	1

OP= Oil prices, SEI= Stock Exchange indices, MF= Medium lending financing, ER= RMB exchange rate

Regression Results

Table 3 shows the regression outcomes of this studies. The R2 value of the model is .57 while adjusted R2 value is .55 which confirms that model have fifty seven percent explanatory power. The outcome also shows that the association between dependent variable and oil prices is significant but negative. The relation between exchange rate and stock indices is positive and

significant while outcomes shows the insignificant relationship between medium financing and COVID-19.

Table 3
Regression Results

Patients	Coef.	Std. Err.	t	P>t
OP	-30.8469	6.10375	-5.05	0.00
SEI	24.56493	6.557945	3.75	0.00
MLF	4238.368	19692.28	0.22	0.83
ER	58132.67	15419.98	3.77	0.00
_cons	-366494	155356.1	-2.36	0.019

OP= Oil prices, SEI= Stock Exchange indices, MF= Medium lending financing, ER= RMB exchange rate

DISCUSSION

This research investigated the impact of the COVID-19 on the economic and financial sectors of China in the short and medium run. This pandemic affected everyone because of the number of people constrained to their homes to avoid transmission. This novel virus not only affects the health of people but has had a great impact on the world economy, and the world is facing the worst financial crisis since 2008. Most people are not going to their jobs because of factories and other working places suspending operations. Therefore, pandemic is affecting the financial position of the individual as well as their health. Since the outbreak, the government of China has stopped all its production units to avoid further transmission. As an outcome, the prices of raw materials like oil, gasoline, and petrol required for regular production activities dropped due to less demand; rates fall to the lowest point in the last few decades. Hence, COVID-19 particularly affected the economy of those countries that have a heavy reliance on oil exports. Figure 2b shows the graph of oil prices in China, and it shows downward slope since this COVID -19 was declared as pandemic as demand from China and other countries became very much less.

The outcome confirms the relationship between the oil prices and COVID-19 (β = -30.8469, p = 0.00), which is similar to the outcomes of Albulescu (2020) who concluded that the COVID-19 have lowered the prices of oil in the international market because governments. Instead of the buying oil, countries are investing in and demanding medical equipment to prevent further transmission. In China, the majority of people rely on small and medium enterprises business, and to meet the financial demands of their business, they heavily rely on government sources of funding. The majority of the companies stopped their activities, so the demand for the financial support declined to some extent. The medium financing curve shows that the curve is moving downward slightly. Thus, this pandemic affects small and medium enterprises, so it will affect economic development if the trend stays for a long period. To support the financial needs of the organization, the government of China has reduced the lending rate from 3.25% to 2.95%, both in the short and medium run. Thus, the result showed (β = 4238.368, p = 0.88), that medium financing have great impact upon SMEs success which is similar to result of Hoseini and Beck (2020).

This pandemic is affecting transportation industry very badly because people are not allowed to move very far, which affects transportation services. The majority of airlines, trains, and local transport were banned from operating to avoid spreading the disease. As result, passenger index

went downward. The statistics show that there is a decline in outflow of people during the peak time of the epidemic in China. As a result, transportation industry faces huge losses, and most airlines around the globe are now almost facing bankruptcy. Currently, analysis shows that the epidemic is controlled in China, so more people are going to their jobs and working, which will have a positive impact on this industry in China. The global pandemic is only testing the health system of nations but testing financial and economic position of countries around the world. As result of worldwide situation, global financial and capital markets are facing severe conditions. Most stock exchanges are showing a decline in their transaction volume, and many companies are going bankrupt. The financial market of China is facing an adverse pandemic situation in the world, and due to this, the Shanghai stock exchange is showing a decline in business in the short run. Shanghai market is facing decline similar to other countries' financial transaction situation.

The stock indices showed that ($\beta = 24.56$, $p = 0.88$) which confirms that the outcomes of the Kowalewski and Śpiewanowski (2020) that pandemic effects stock market badly but as China have strong finical position so it medium run it recovered very well and now showing upward trend. The Shanghai stock exchange data indicates that the index dropped due to this financial difficulty in the world, showing that this pandemic affects the stock market of China as well in the short-run but in medium run, it showing a normal trend. The exchange rate of currencies is also being affected by the novel coronavirus, and currencies linked to US dollars have gone downward. The exchange rate graph shows that the value of Chinese RMB with respect to the USA dollar initially dropped due to this outbreak in the short run. Later, however, in the medium run, the situation in China got back to normal, and conditions in the USA got worse, so the Chinese RMB is gaining its value against the USA dollar ($\beta = 5812.67$, $p = 0.00$), which will boost the Chinese economic position. The pandemic in China is almost controlled, and now people are going towards normal life (Sarwar, Khan, & Sarwar, 2021), so the government of China should continue to pay attention to controlling the importation of this virus back to China.

CONCLUSION

The pandemic has affected every aspect of life. As the time passes, the situation outside China is becoming worse; if timely and wise decisions are not made, then the world will face a worse financial and economic situation than it has ever faced before. As for other countries, they must first give better health facilities to ill people to save their lives. Actions must continue to limit the transmission of the virus from human to human. Governments should give financial aid to industries and local businesses so that they able to face the financial crunch at the international level. The interest rate must be as low as possible to avoid the bankruptcy of different sectors. National governments should support all production sectors to boost the economy of countries which have been badly affected by COVID-19. Government should give low-interest loans to small businesses so that they can overcome losses of their business during this pandemic. The government should provide job security to employees and provide financial benefits. Financial, capital and transportation industries must be given incentives so that they come back to their regular business and face worse financial situation across the globe. With the help of public, the government of any country can boost its economy again by first controlling spreading of COVID-19 and allowing businesses to operate, providing incentives so that companies can do business with ease.

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