# Impacts Of COVID-19 Pandemic On Main Economic Indicators

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**ABSTRACT**

This paper focused on analyzing the possible effects of COVID-19 on global financial markets, that data on the outbreak are still insufficient to fully understand its medium and long term effects. To provide this paper, the study applies Structural Vector Autoregressive (henceforth: SVAR) to examine the effect of Pandemic (structural shocks is based on sign restrictions) as an exogenous distraction influences on financial market participants. The purpose of this paper is to provide an initial evaluation of the global economic impacts of this Pandemic as well as to provide a more comprehensive approach to estimating the consequences on economic indicators. Increased linkages within economies across real and financial sectors as well as across economies in both international trade and international capital flows caused by increased financial linkages associated with the globalization of production and financial markets.

**Keywords:** COVID-19; Financial markets; International economics

## 1. Introduction

The widespread suffering that was suffered by humankind is defiantly one of the clearest effects that were shown by 2019 novel Coronavirus (henceforth refer to as COVID-19) originated in Wuhan, China, in late December 2019, but will try in this paper on the subject of impacts that this virus on economic indicators and try to explain the sores of these effects to put a future first impression of these damages along with their duration. The repercussions of the spread of the COVID-19 still constitute major pressures on global economy(Organization, 2020). As countries of the worldwide struggle to contain the deadly virus with more than 188 affected countries and territories, it has become increasingly clear

that the turmoil in China's economy might spread to threaten the rest of the world. While Chinese provinces in the mainland that were directly affected by the virus, which account for nearly 69% of Chinese GDP, are almost completely disrupted, with factories, shops and restaurants closed, and ships trapped in the port are left, household spending has also declined.

Strangely, these events came when the whole world was just on the right path for recovery with the ease of economic tension between China and the USA which was a result of a political one. Trade, oil prices and financial markets all of them were optimistic about all the promising data for signs of reconciliation between these two main poles in international politics. The widespread of the virus shed light on the risks that accompany the rapid pace of its movement quickly and easily, which were linked to the growing volume of trade and economic relations between different regions and countries of the world which pushed International Monetary Fund (IMF) to revise its Global economic growth downwards for 2020 to minus 3% following a 2.9% growth for 2019, the lowest in a decade (Gita Gopinath, 2020). But the measures were taken to counter the crisis showed the negative repercussions of stopping the wheels of globalization from turning, closing borders, and placing restrictions on the movement of people.

In what some analysts considered a preliminary display or "rehearsal" of what might face the world in the future if the anti-globalization current prevails strongly in several countries, especially in the America particular. The globalization effect has its role in the rate of international contagion of COVID-19, the acceleration spread of COVID-19 internationally is much greater at a contagion rate of 0.77 than other diseases like SARS which only registered a rate of 0.35(Simulation et al., 2020).

The new dramatic events in worldwide forced multinational businesses in Mainland China and other places to make hard decisions of selling their assets or even full closures of their work with limited information on the possible scope of the crises and possible developments in it. Wuhan has been identified as a principal financial and transport hub for central China, also serves as home to more than 300 factories of the world's top 500 companies.

Keeping in mind the fears associated with the bet made by Matin Rees (2003) in a book he published called "our final hour" that 2020 will be an instance of bio-error or bio-terror that might kill a million people, according to his expectation. it is fair to say that another reason that prompted the first author to work on this particular issue is that the area of his residence within the Tunisian capital has been declared a region heavily affected by the Pandemic and subjected to complete closure and sanitary isolation, which increased the incentive to address this issue and analyze its effects on the overall life of individuals Which is a reflection of the overall financial and economic reality.

2.  **Statement of the Problem:** To state a problem, it is focusing on the following:

The gap between the inflexibility of physical capital within sectors and increasing Globalization of production was the main reason to increase negative effects of COVID-19.

3.    **Significance of the Study**: Realizing the importance of studying the new case that invaded the world and had the most impact on the overall social and political reality in various countries of the world, but there are a set of economic reasons that led to prepare this study, including to provide a primary assessment of the relationship between COVID-19 and a lot of the economic factors through financial markets, investment and oil prices. our research stand somewhere at the crossroad of a couple of literature topics that may be from the first appearance looks different, but in essence, they are closely related, the first one looks into the impact of the COVID - 19 on different economic variables like investment, oil prices, and international trade. While the second one will take special attention to the epidemic disease effect as an external factor affecting the risk criteria.

## 4.  Hypotheses of the Study

**4.1. H 1**: The impacts on consumption and investment behavior through changes in the cost and risk of doing business changes caused by COVID-19 will have its global effects as a result of economic interdependence and Globalization of mass production.

**4.2. H 2:** The financial markets will be the main tool for conveying the economic impact of the emerging Pandemic. This tool will have its impact on many economic sectors especially through oil prices and FDI.

## 5.  Current stand:

The Corona Virus crisis spurred a hostility towards China, as the repercussions of the crisis demonstrated its pivotal position in the heart of the global economic system, which raised fears of the repercussions of "excessive dependence" on it as a driver of the global economy. China's wide-ranging measures to counteract the spread of the virus have almost halted the movement of products and people, in conditions of sanitary isolation. The growth in China's first-quarter GDP may drop to 4.5% (O. Evans, 2020: 6).

Abroad, many airlines have canceled flights to China for fear of transmission. The impact of the synchronization of these measures on various sectors of the global economy has been significant. Companies that rely on Chinese factories to manufacture parts of their products have also been affected, including companies in Germany, the United States, and Vietnam, as they are threatened by the inability to continue working if the Chinese machine does not continue its activity and supply it with production components (Gonçalves-Sá, 2020). Airlines also suffered heavy losses due to the suspension of flights to China, and then these losses increased by preventing flights to other countries where the virus appeared. Besides,

the tourism sector was affected in many countries. Not to mention the decline in demand for oil, this led to a decrease in its prices, and a decrease in the movement of cargo transport through ships and ports and increased the expenses of transporting costs which are showed by Baltic Exchange Dry Index (BDI) reflects the shipping costs of raw commodities, a study measured that one more global COVID-19 death results in 0:05% of a cumulative reduction in BDI after one week, 0:10% of a cumulative reduction after one month, and 0:11% of a cumulative reduction in the long run (Yilmazkuday, 2020:4).

A study suggests that having one more COVID-19 caused death would be reflected in 0.02% of a cumulative reduction in the S&P 500 index after one day, 0.06% of a cumulative reduction after one week, and would cause 0.08% reduction after one month which shows that there is a direct and gradual increasing relation between the period of the spread of disease and its effect on S&P 500 index (Yilmazkuday, 2020b). Easterly (2009) provides a good proves of the role of epidemic diseases as influencing factors on risk factors on FDI and International Trade and other economic factors.

US 10-year Treasury yields fell below 1% for the first time after the Fed's decision to cut interest and announce it down to zero (zero-coupon government bond) for the first time since the 2008 crisis, along with the US Federal Reserve announced for the second time in two weeks since the bingeing of the Pandemic several measures, including allowing banks to borrow from the discount window for 90 days, which means that a global financial crisis looms on the horizon and this, in turn, leads to a decline in oil, where gold prices jumped more than 3% after the American central bank cut interest rates to help protect the economy from the resulting economic damage and gold jumped in immediate transactions 2.9% to $1636.25 for ounce stepped-up US contracts went to 3.5 percent recorded at the settlement of $ 1644.40 an ounce. The yield on 30-year treasury bonds also fell to a record low of 1.601%. The US Dow Jones Index (which reflects an industrial index for the 30 largest American manufacturing firms on the NY Stock Exchange) fell more than 3%, equivalent to about 900 points to 25,797 points, and the S&P 500 index fell by 3.3%, equivalent to 100 points to 2990 points. The Nasdaq fell 3.4%, equivalent to 303 points, to 8,660 points. Even a bigger effect was reflected on the S&P500 index that represents 70% of market value, where there was a huge decline at 3386 points at 19/2/2020 to 2386 on 16/3/2020.

The COVID-19 has officially been declared as a pandemic by the World Health Organization (WHO) in the media briefing announcement on March 11, 2020 (World Health Organization, 2020). To understand the full extent of this announcement, we have to understand first the difference between the two. According to Centers for Diseases Control and Prevention (CDCP) an epidemic is a sudden spread in the number of cases of a disease more than what's typically registered for an area (city, region or a country). A pandemic is an epidemic that has spread between countries or continents, affecting a large number of people (Whitworth, 2020).

## 6. Economic effects of the COVID-19:

This crisis is unique in terms of quantity and quality, and it affected all sectors as a result of banks being affected by it, which is a mediator for all sectors. The disturbances were not limited to the financial, monetary and stock markets, but there were disturbances and collapses in financial institutions such as investment banks and insurance companies. Those collapses began in China, and soon they were transferred to the European Union and in later stages to America and various countries of the world. Growth rates slowed down, which led to low demand for oil and lower prices, as well as the economic recession in addition to the focus towards saving the financial industry in the world, which led to a decrease in the level of humanitarian assistance to developing countries. The transmission of infection to other commercial and industrial sectors, which led to the layoffs of thousands of workers, the emergence of resources of economic recession, and a decline in economic growth.

The concern in this crisis is the speed of its expansion from its position in the Chinese economy to the rest of the global economy as a result of the interconnection of financial markets and the resulting repercussions on more than one level, which were emphasized by many of the international financial institutions and their money. But in varying proportions and perhaps the most important of these repercussions on the global economy are as follows:

1- Expect the decline of neoliberal ideology, which is based on the liberalization of markets and assumes that it will organize itself in favor of the economic thought that calls for the ideas of the social market economy, which is based on the necessity of giving the state a growing role in the planning and intercourse with the planning of the economy.

2- To demonstrate that the management of the economy under the market mechanism will suffer from the lack of conditions of its operation from imbalances those necessitate the intervention of the state to address it.

3- This crisis has created instability and volatility in the global financial markets and created a state of intense fear among investors regarding the future of the economy and investment, which called on many of them do not want to take risks and search for other investments in investments. To claim risk premiums beyond government, in addition to the doubts and ambiguities surrounding mergers and acquisitions. Within the new amounts of debt instruments.

4- The sudden stoppage of movements in capital and investments caused a rise in a misallocation of capital (Pelletier, 2017). Along with the effect of infections in the age group of 15–44 years, those active in the labor force, will have its profound and prolonged effect on the Labor force market. travel restrictions are expected to result in less commercial activity of industries and less demand for resources which includes labor force to support activities (Yu & Aviso, 2020).

It can be said that the global financial crisis that ravaged the global economy has indirect effects in other economies, the most important of which is a slowdown in the growth of

these economies and a decline in exports (oil and non-oil) and a decrease in the flow of foreign investment, in addition to maintaining low exchange rates towards most of the trading partners' currencies. These financial market crises were very clear through (Binder, 2020):

1- Money markets decline and affect the returns of sovereign funds and markets for goods and services.
2- The remittances of workers abroad decreased.
3- Low investment flows that are not expected to be regained again easily.
4- Decreased tourism revenues.
5- Increasing unemployment, poverty, and weak job creation.

Despite that COVID-19 is not this first Pandemic to hit humankind in the last two decades, but the speed and scale of its spread in a globalized stock and financial markets made this new version more effective to the worldwide economy. Comparing the fatality of the COVID-19 that is estimated now at less than 3% compared with more deadly viruses with much higher fatality rates like the 2014 Ebola virus disease (EVD), typically estimated to be around 50–70%, (Webster, 2019). Whereas it is on the other hand much different on the economic impacts of these two, the 2014 EVD were estimated at smoothing around $25.2 billion (D. K. Evans, 2014), the assessments on COVID-19 suggests that it can cost the world $1.1 trillion in lost income (Anderson et al., 2020). Some other studies estimate the China economy cost to be a drop its GDP which registered in 2019 an amount of US$ 14.30 trillion dollars to GDP (the year 2020) = US$ 10.00 trillion dollars (Arturo et al., n.d.) The difference is very clear between the two cases because of the Chinese share in world GDP as China is the second-largest world economy, with 19.251% of share in GDP after EU at 20.457% in 019 (IMF, 2019 extending beyond the borders of the country with obvious impact in the rattled stock market (Ayittey et al., 2020).

The fear of infection from COVID-19 led to a substantial decline in consumer demand, especially for tourism and travel that both are traditionally related with social interactions that have been defined as the main cause of infections, which is strengthened by the fact of uncertainty that is related to the period of the impact of the Pandemic on the overall global economy. One more important factor that will affect direct investment and financial transfer is the cost increase related to procedures related to disease prevention and compulsory closure that was implemented in many regions. The negative effects are expected to be exacerbated in the developing economies more than in the developed economies, due to the fragility of these economies, and the lack of financial and material resources to face the crisis. The impact is expected to be greater for the most vulnerable and poor groups, stopping small businesses, and activities that the poor depend on in both categories of countries (Khadim, 2020).

The world's 500 richest people collectively lost more than $600 billion in 2 weeks from February 21 to 7, 3, 2020 as a result of the pandemic which is affecting citrine sectors more than others, viewing the one-year performance of the individual fortunes on the Bloomberg

Billionaires Index, along with the performance of billionaires grouped by industry 23/3/2020 shows that change in net worth grew in the healthcare sector by 1.8% and services by 1.64%, all other sectors showed big losses for the same period starting with finance with a percentage of 5.35%, retail 5.82%, industry 6.28%, technology 8.1%, the biggest loser is energy sector 24.9% (Metcalf et al., 2020).

The uneven distribution of wealth was identified as the main cause of oft-referenced in fixed assets which is been artificially inflated by the Fed, which ultimately was pushing the global economy as predicted by Jesse Colombo in 2018 to a bigger bubble than the ones we saw in 2000-2001 and 2008-2009 as the share of household-wealth growth exceeded gross domestic product, or GDP, with a greater effect which he called "everything bubble" (Kollmeyer, 2018). The steady growth of overvaluation of equities was expected by Colombo to cause the current situation regardless of the results of the COVID-19 Pandemic outbreak that we are hurtling towards recession because of so many bubbles that were growing in economies, one of the largest is a Chinese credit bubble driven largely by infrastructure spending. The policies that were adopted by Billionaires were to invest mainly in guaranteed projects with no intention to get into tasks they don't manage all of its variables and can control (Rich, 2020).

A lesson to be drawn from the current suffering of global economies is that globalization, as we have known it, is fragile for the same reason of its success that is the individual incentive to make profits. This reason reduced the number of unused resources, what economists refer to as "slack", in the global economy as a whole which made broader system brittle in times of crisis like the one we are going through, eliminating critical fail-safes which would have helped to combat the collapse in the demand and supply sides (Farrell & Newman, 2020). The current era of globalization does not recognize production away from specialization, regardless of storing it. The world is one and companies are intertwined and there is no economic feasibility of local production if it is possible to obtain it with quality and at a cheaper cost. The only feasible and expected response in this optimistic globalization is that the response is just In time. But it became clear at the time of the Pandemic that the Technique Just in time was too late. The global economy has not functioned in the supposed way to cope with this type of crisis. There is no doubt that globalization, which has taken its range over the past decades. However, there is particular fragility in this system that was exposed by the shock of the Corona pandemic crisis. This may indicate a shift in the paths of globalization itself towards national priorities so that when the matter touches the health security of citizens of countries, commercial and non-commercial obstacles will be imposed to prevent trade in them, even if this leads to harm to allies and neighbors.

To see the full picture that is expected as a result of this pandemic, we have to take a look back into the global debt accumulation waves that have ended with crises in the last fifty years, starting with 1973, 1987-89, 2000-01, 2008 and 2011 all were synchronized with a high total dept percent of GDP. In first one, that percentage was 119.3%, 169.8%, 190.1%,

196.6% and 212.7% respectively. Whereas the first three waves were considerably more pronounced in some regions of the world than in others, starting from the fourth wave they have become more of a global type (Kose et al., 2020: 16). the cost of rolling over the debt that happened before can easily increase sharply during periods of financial stress that can accord easily with global markets and result in costly crises. High debt can as well, limit the ability of governments to provide fiscal stimulus during downturns like the one we are seeing because of COVID-19, and high debt can weigh on investment and long-term growth.

This new debt crisis was accompanied by a shift in their risky pools from households and banks in the US, which were mainly to be blamed for the recent crises and were restrained to some extent by regulators afterward, to corporations all over the world (Sharma, 2020). These corporations and companies include ones that more known by the term "zombies"— to refer to companies that earn too little even to cover interest payments on their debt with negative equity, and survive only by issuing new debt on their shares (Ivana & Ondřej, 2020).

## 6.1. Spillover to Financial market

Market indicators have fallen because the events taking place abroad portend bad conditions for businesses shortly. Other than that, we find ourselves faced with the problem of the global supply chain, as financial analysts predict a "growing effect" that begins with the disruption of the global supply chain, which in turn will slow down the production of familiar goods. If any trade, any of the companies registered in the trading of financial markets depends in the production process on a country that has been affected by the repercussions of the Coronavirus or if it has a large consumer base abroad, the outbreak of the Coronavirus may have major negative effects on its sales and manufacture of goods, thus achieving profits.

On the other hand, some believe that the Chinese government may have succeeded by buying shares in high-value-added technology companies that are owned by European and American investors at minimal prices to get rid of them, as it reaped about $ 20 billion in two days of the spread of the Pandemic. Before the COVID-19, the stocks and stakes in investment projects of "technology and chemicals" companies were mostly owned by European and American investors. This means that more than half of the profits from light and heavy technological and chemical industries went to the hands of foreign investors, and not to the Chinese treasury, which led to a decline in the Chinese currency, the Yuan, and the Chinese central bank could not do much In front of the continuous fall of the Yuan. This indicates that China may, through this process, nationalize most of the foreign companies located on its soil in a near-free manner, without causing a political or economic crisis.

Returning to the measures adopted during the global financial crisis in 2008 that worked to create traditional non-monetary policies such as zero interest rate, quantitative

management, etc., however, commercial banks did not respond at first and were forced in one way or another to borrow to exit the crisis. This indicates that the reason for the failure of these approved tools was due at the time due to a loss of confidence between the business sector and individuals and the Federal Bank. And the lack of response of the main financial markets indicators in the United States and the world, and the dow j index we review more than 3000 points, despite the quantitative easing measures adopted by the US government, due to the lack of confidence between the same categories of businesses and individuals and the Federal Bank that was lost in the previous financial crisis as Accompanying the supply and demand crisis together this time.

This pandemic is not the first to hit the post-war world like Spanish Flu, or H1N1of 1918-1919, Hong Kong Flu, or H3N2 (1968 - 1970), HIV/AIDS (1981 - present), SARS (2002 - 2003), or Ebola (2014 - 2016). Still, COVID-19 overtook countries like the US, China, Japan, Germany, the UK, France, and Italy those accounts for 60% of world supply and demand (GDP), 65% of world manufacturing, and 41 of manufacturing exports (Hanna & Huang, 2004). The confusion in the financial markets, currency markets, and global crude oil prices are all a reflection of the imbalance in the real industrial sector, which is due to a set of different factors, the most prominent of which are:

- Disruptions in the production chain caused by the partial and full closure of manufactures that are sited in countries were the virus was first observed along with new difficulties in importing of necessary industrial inputs because of restrictions and containment measures implied on imports from the hard-hit nations.
- Demand disruptions due to a drop in purchase delays by consumers and investment delays by firms that entered the clash of expectations. Other macro factors that are related to the demand side, including hangover effects from the Pandemic and deep-prolonged recession that followed it, cause a productivity downturn. This is one of the reasons that prompted the International Monetary Fund to require central banks to adopt supportive policies to strengthening demand and confidence in economies by easing financial conditions, ensuring the flow of credit to the real economy, and protecting liquidity in domestic and international financial markets (IMF, 2020).
- Putting many factories and industrial sectors in a "negative economies of scale", where production takes a sudden stop to cause the fixed and quasi-fixed cost to be beard because cost base can't fully be adjusted downwards(Pelletier, 2017).

The effect of this confusion on the supply chain can be seen clearly in the Caixin China General Manufacturing Index (PMI) which is put upon a panel of around 500 private and state-owned manufacturers. The index shows a decrease to 40.3 in February 2020, which is the lowest since the beginning of that survey since 2004 which is expected to regain its ability to be 48.70 points by the end of the current quarter which is very close to its highest level that reached the highest level at 52.30 just at the end of 2019.

**Figure 1 China Caixin Manufacturing PMI**
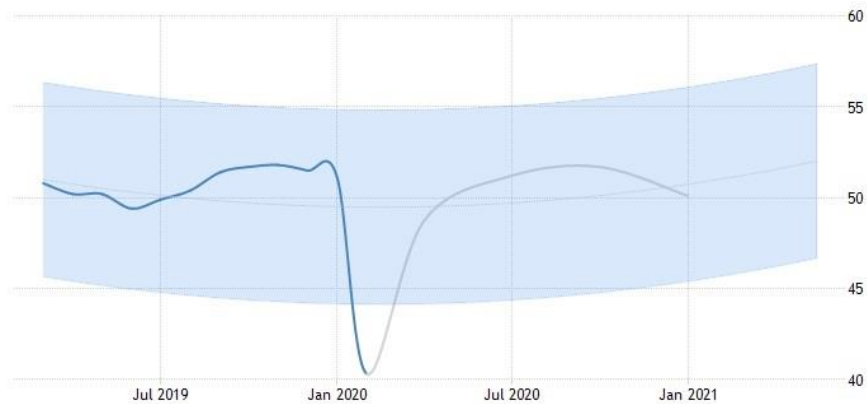


Source: trading economics, https://tradingeconomics.com/china/manufacturing-pmi

The sharp drop was due to the Iceberg phenomenon which was first applied for diseases by (Last & Adelaide, 2013) wherewith every health problem we may face, the number of known cases of the disease is outweighed by those that remain undiscovered. Expectations of an increase in the crisis with the steady number of diagnosed injuries and deaths recorded with the passage of the first days of the Pandemic crisis led to more pessimistic expectations of the future of global supply and demand. This pessimistic mode reflected mostly on financial markets where it can be seen from the figure (2) that the Shanghai Composite index tumbled from its highest at 14th of January, 2020 that registered (3112) to reflect the increasing number of cases of a new virus outbreak to reach unprecedented low level since the beginning of 2019. Soon on the index returned to recover many of its losses in just two weeks period.

**Figure 2 Shanghai stock exchange index**
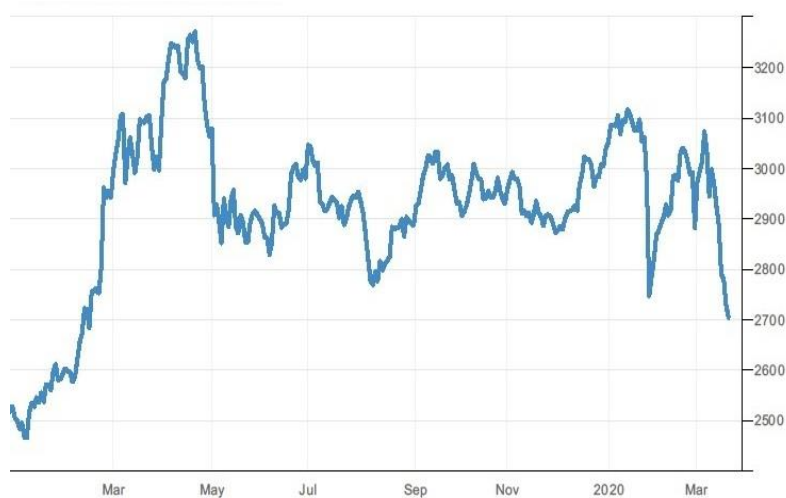
Shanghai Stock Exchange Composite Index
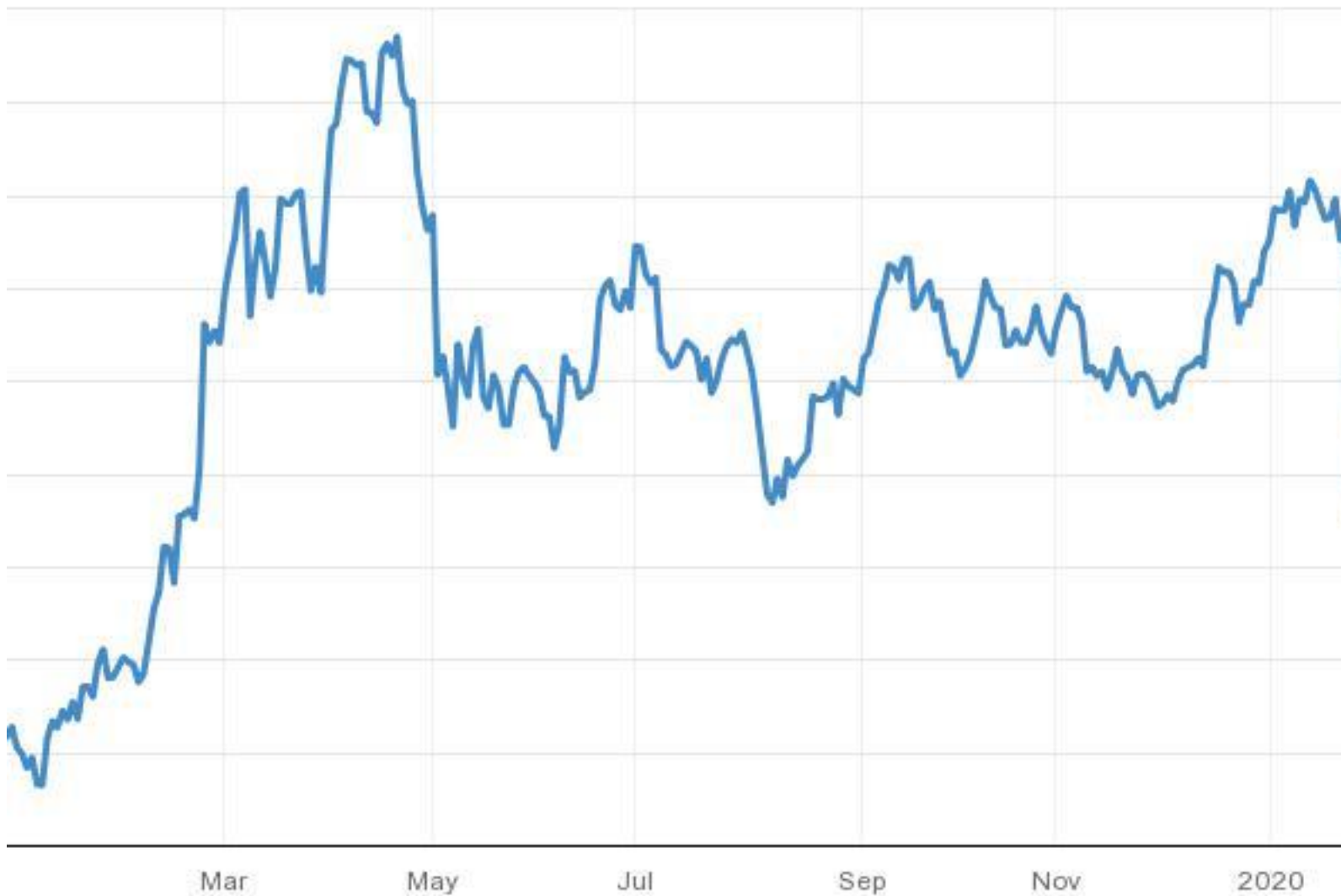


On the other side of the world, we come to realize the US Government is taking long term procedures and plans to confront the cross-sector supply chain confusion that was caused by this Pandemic, these plans are put into the coming 18 months to coordinate federal response activities for COVID-19 in the US (Use et al., 2020: 62). It has to be clear the longer it takes to contain the infection, the more negative impacts it will have on domestic demand for non-tradable services. The long duration scenario seems more likely to be a result of the geographical expansion witnessed by the recent Pandemic among the countries of the world, the speed at which it is transmitted between individuals and the lack of rapid access to the treatment required for recovery or prevention.

The decline in global stock prices and bond yields deepened more after the failure to reach an agreement between OPEC and Russia to reduce oil production and the Kingdom of Saudi Arabia's adoption of a policy to flood oil markets with production amounting to 12.3 million BPD, which caused the collapse of crude oil prices to historically low levels which Some people estimate that it will reach less than $20 per barrel (Raduzzi & Ribba, 2020). some others expect the prices of oil to worsen even more and reach $10 Per barrel (Jang & Beruvides, 2020).

The COVID-19 has increased the risks to the current phase of the global business cycle, which has delayed from its expected time by more than ten years that lasted five years on average in the past (Gabriel Casillas, 2020).

### 6.2. Spillover to Oil sector:

On the eve of the outbreak of COVID-19, oil prices managed to accommodate this event although China that witnessed the first cases of shutdown and closure was an uncompensated Importing country with an estimated 10mbd out of 98mbd of total oil production worldwide(Ajami, 2020). This was until the (WHO) released its first monitoring report on March 9, 2020, which coincided with the flooding of Saudi Arabia the oil market with crude oil as a part of an oil price war which was offset by a Russian increase in production to cause a sudden drop of 24% on the same that day from 45.27$ to 34.36$ (Albulescu, 2020). The fall in oil prices was Pretty much justified to investors' flight to safety during the outbreak of the pandemic (Ozili & Arun, 2020: 10).

COVID-10 the same time it causes a noteworthy shock in financial markets, it also caused noticeable on commodity prices, among which is oil. One important factor that affects oil prices is the stock prices, (Illing & Liu, 2003) emphasized that that oil price shocks correspond to picks in the financial stress index and showed the high correlation between stock prices and oil prices, as well as the relationship between oil prices, financial volatility and the economic policy uncertainty (EPU) (Negus & Pickering, 2004). The overall impact of oil price shocks on EPU is positive at all frequencies

The outbreak of the disease caused a sudden freeze in the world economy through the downturn shifting of demand and supply curves in all industries and trade as a result of a reduction in the movement of people and goods, combined with unclear future of overall demand with low demand for oil products in the international market. This resulted in a drop in demand for oil which was reflected in its prices with expectations to be for a long period with the persistence of the virus (Albulescu, 2020: 10).

The vicious circle caused by reduction in oil prices which will be reflected in GDP of the Middle Eastern (MEC) oil producers' and results in their ability to continue importing goods and services which will be reflected in a reduction in government budgets of the (MEC) countries because of their high dependence in funding it on the revenues of oil exports that were assumed in the range of 50 $/b (Ajami, 2020). Furthermore, falling oil

prices if continuing for the near future will increase debt servicing costs for many of the domestic oil companies and result in a decline in investment in this sector(Kingsly & Henri, 2020).

As for each of (Simon P. Lloyd, 2019: 34) and (Atanasov & Nitschka, 2013), economic or It was followed by disasters or crises are preceded by US yield curve inversion which arises at the onset of crises and when the probability of a disaster is high, they conclude that this yield has nothing to do with monetary policy. This inversion can be seen on the eve of the outspread of the COVID-19 (Smith, 2020). A yield curve inversion is the case when the long-term rates become lower than short-term ones, suggesting a bigger possibility of a recession in markets, which will cause a decline in interest rates in the near-to -mid-term. The fact that negative yield Indicates strongly to the market's anticipation of cuts to be followed in interest rates by the Federal Reserve because of an oncoming recession sign (Pan, 2006).
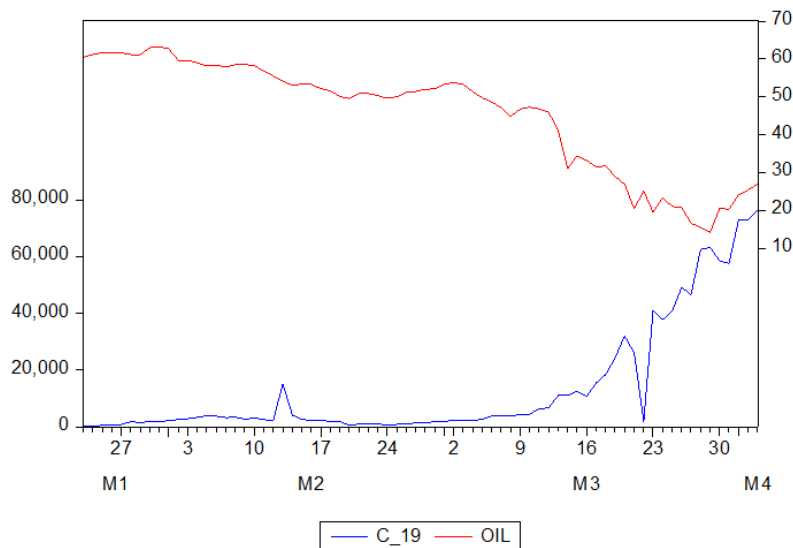


**Figure 3** Oil prices and new COVID-19 cases worldwide for the period 23/1/2020 to 3/4/2020
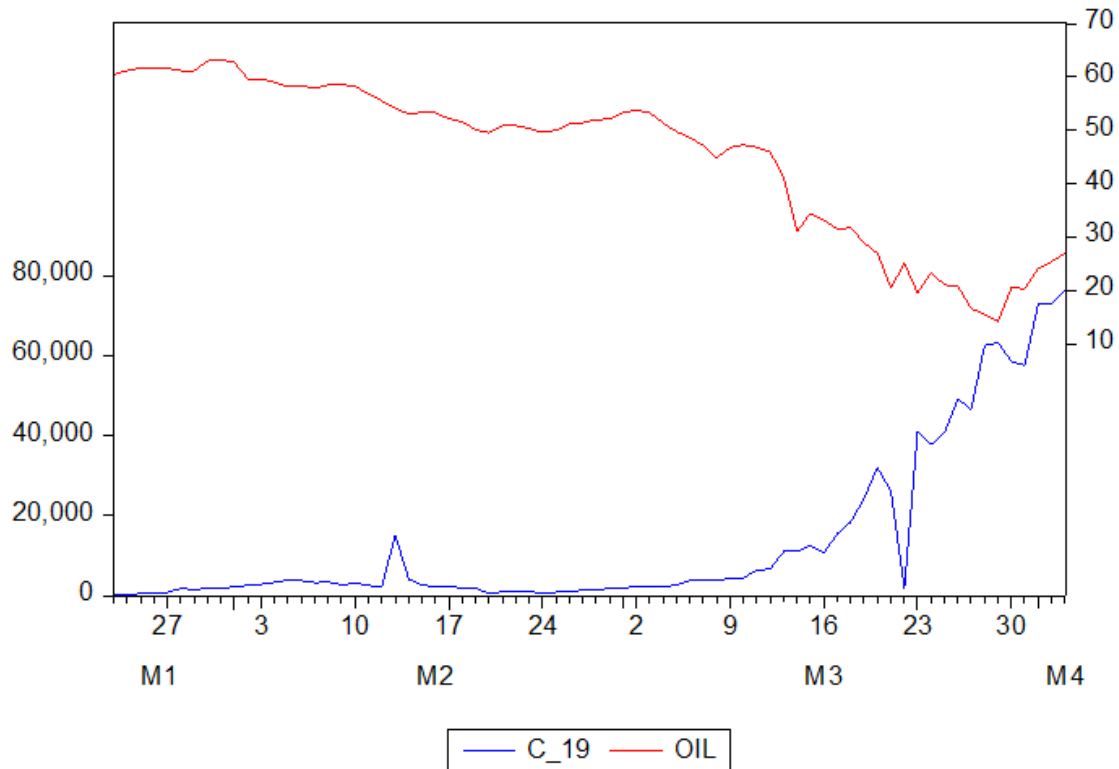
figure (3) shows the inverse relationship between the increase in the number of COVID-19 infections and the prices of crude oil (Brent), the rapid spread of the virus led to a movement restriction gradually in all countries, especially the developed countries, which are the main consumers of crude oil, which led to the stoppage of many economic sectors that consume oil products, Therefore, a clear drop in the price of crude oil can be noticed, as the prices at the end of January were close to the level of 60 US dollars, then they decreased and reached the level of 20 dollars at the end of March 2020, that is, with a negative growth rate of 66%.

## 7.  The first victim and the last beneficiary:

China was heavily affected and the first countries to witness cases of the epidemic, but it is expected to be able to recover before the whole world, the ability of China to recover is greater than the ability of Europe or the ability of the United States for two reasons: The first is that the Chinese government is a one-party government, a central government, It has complete control over people's destiny and life, while European countries cannot do so for a reason related to the nature and life of societies which will lead to a rise of China's importance in the world economy as a replication of recent growth experiences of each group of countries (McKibbin & Fernando, 2020: 22).

Chinese trade and industry, which the world needs and which was damaged at the time, is

returning to work. Today we hear that ninety percent of the factories are re-producing them. If China can do that in the coming days, the Chinese economy will do two things. The first goal is that it will start providing the world with the most needed medical tools and equipment such as masks, respirators, and so on. And the world will attack Chinese factories to take what they can. The second goal is to try to win the countries of the world by providing them with expertise and capabilities to fight the virus.

The main impacts on the Chinese economy will be on the 4 sectors that will be reflected on its GDP through (Ruiz Estrada et al., 2020: 10-11):

1. In the tourism sector, demand in this sector will decrease by 75% which will, in turn, result in the rise of unemployment by 10% with an overall contribution of this sector in China's GDP of 0.3%.

2. The international trade sector, demand in this sector falls by 40% which will be reflected in the rise of unemployment in this sector by 35%. This effect is reflected in a decline in FDI by 35% and the contribution of this sector in the GDP growth rate in China by 2.5%.

3. The air transportation sector was the most affected sector with a drop of 85% in demand, a 20% rise in its unemployment and 40% in its FDI. The contribution of this sector in the Chinese GDP growth rate is 0.2%.

4. The electricity consumption sector experiences a growth rate of 65% and an increase in FDI of 50%. This sector contribution to China's GDP growth is 1.5%

Central banks around the world warn that the monetary crisis the world is witnessing after the Pandemic will lead to a financial crisis, as happened in 2008. This was the reason behind the Federal Reserve took aggressive easing measures to prevent the markets from further confusion. The matter is not different in Europe, as French Finance Minister Bruno Le Maire said that his country will pump €45 billion packages, equivalent to $50.22 billion, into the economy through emergency measures for companies and workers, at a time when economic output is expected to shrink 1% this year because of the outbreak. For its part, Spain announced a massive 200 billion euro package to help companies and protect workers and vulnerable groups affected by the Coronavirus crisis. These packages, which amount to about two percent of GDP for most EU countries, will inevitably burden the public finances of these countries and pay the public debt to exceed the GDP.

Some data indicate that Ovid-19 has increased search intensity for topics related to economic recessions by 17.8% relative to the pre- epidemic search patterns, the same even bigger pattern was indicated on the intensity of the search for topics related to stock market crash rose by 58%. These facts indicate that the arrival of the coronavirus substantially increased economic pessimistic outlook (Fetzer et al., 2020: 3). the Pandemic of COVID-19 will make the economy more vulnerable to stagnation traps of low growth and high unemployment caused by an overwhelming pessimistic, in such a scenario, an aggressive fiscal policy intervention should be taken by countries (Fornaro & Wolf, 2020).

## 8. Future possibilities:

One of the things that have been confirmed according to recent economic historical studies, is that there are four forms of recovery following the stage of financial & economic recovery, the first of these forms is the one that takes the letter (V), which means that there is a rapid bounce from the bottom of the economic recession or the lowest level of economic indicators. The second shape is very close to the first one, but the bounce period takes a relatively a long time and this shape takes the letter (U shape), which means that the recovery occurs after a period of stability of the main indicators Such as unemployment rates, economic growth, indicators of consumer and producer confidence, etc. for a period at the minimum levels, which heralds the end of the worst part of the recession, the bottom of the economic depression (Eggertsson & Egiev, 2019).

The third shape is what takes the form of the letter W (Double V), where economic and financial indicators rebound up quickly in a sign of a rapid recovery from the recession, but a large part of the expectations on which the rise was built, especially in the financial markets as they precede the recovery of the economy, a large part of it has not materialized on the ground, and then a major setback occurs again, whether at the level of economic indicators or the level of financial markets, with a second steep decline (Aiginger, 2010). As for the fourth and final shape of economic recovery, it takes the form of the letter (L), which means that the recovery stage has come after a very long period in terms of the stability of economic indicators as well as financial market indicators, to the degree with which the length of this period cannot be predicted.

Before examining the possibility of verifying of one of these four shapes is weighted according to the current situation, and what has caused - and still is - the COVID-19 in the global economy, it is necessary to distinguish between the concepts of stagnation and recession, so is there a difference between them. Recession is a significant decline in economic activity that lasts for several months; the Depression is more severe than the recession, but rather an economic catastrophe whose effects may extend for several years, with real GDP decreasing by more than 10%. Hence, showing the strength of the recession by turning it into depression or not will result in a possible recovery. Given the "economic forms of recovery", which will be determined based on two factors: The first is the situation that will lead to things after the end of the crisis caused by the "Coronavirus", either by limiting its spread gradually or finding the appropriate vaccine for it. The second factor is the degree of interaction of the major and influential countries, headed by the G20, in finding plans and alternatives that are in line with the scale of the challenge.

The first form of recovery (V) may be excluded for most countries of the world, in light of the coincidence of the economic effects of Corona with the economic and financial stagnation that was indicated in the paper and confirmed its occurrence in several countries and several studies have emerged confirming it before the emergence of the virus. The virus has only come to accelerate the assertion of economic stagnation in several countries, especially in the United States and several other European countries. This means that the

crisis caused by the virus was not an emergency and that recovery from it will not be rapid.

The third form (W) is difficult to predict at present. At least until the losses caused by the virus are counted, and governmental measures taken in several countries are followed to contain its effects, and at the same time address the recession that has begun to emerge gradually with strength.

We have two forms of possible recovery shapes (U & L) that are expected to take the form of recovery. The recovery is in the (U) shape and despite the length of time that economic indicators spend until recovery, they often do not take many years and after that recovery is strong and solid, like the Great Recession of 2008-9 (Gertler Mark & Gilchrist, 2018). However, the increasing globalization of production we have witnessed in recent decades, trade and financial markets nowadays may have led to a cumulative downward spiral that is quite impossible to stop through national policies.

As for the economic recovery that may come in the form of the letter (L) will come after the passage of many unpredictable years, and often comes after the outbreak of global wars that reshape the global political and economic landscape. This form of recovery was achieved only once when the Great Depression occurred in 1929, and that did not end until after the end of the Second World War in 1945, after which the recovery began with the economic project of Marshal to reconstruct Europe, which he announced in mid-1947, meaning that the recession took a very long time, almost twenty years to reflect the very big ambit of implications that the current epidemic will have on the global economy that lies in the severity of it, ease with which it spreads, and its high mortality rate (Baker et al., 2020) along with the duration of the crises which seems unclear until now (Baldwin et al., 2020: 18).

## 9. Modeling the relationship between COVID-19 cases and crude oil prices:

### 9.1. Data and Methodology

In modeling of this study, we look into the basic reported number of COVID-19 and the outbreak size in worldwide from its first outbreak at December 2019, based on the number of confirmed cases, to match them with selected economic indicators with special attention to study world oil prices as it had a big impact on many other economic factors.

.We will work on an estimated Structural Vector Autoregressive (SVAR) which was developed by Uhlig, (2005b) that is an improvement on reduced-form VAR. Structural vector autoregressive models (henceforth: SVAR), which is an advanced form VAR through economically meaningful shocks with a Bayesian sign-restriction approach, generally be in accordance ($p$) of Structural Vector Autoregressive rank, the structural model of Auto-regression will be(Levendis, 2019:332):

$$A_0 Yt = \sum_{i=1}^{p} Bi Y_{t-i} + \varepsilon_t \qquad (2)$$

Where:

$Y_t$ Internal variables vector

$B_i$ Vector matrix for the Auto-regression vector

$\varepsilon_t$ The structural random error vector, its co-contrast is assumed to be equal to zero and does not contain a chain link.

$A_0$ The matrix containing contemporary correlations between variables

The SVAR methodology is used in this paper because it can give an account for endogenous relationships, and provides the empirical relationships without requiring too many restrictions on the data that are not very available now (Kim & Roubini, 2000).

Here, we will assume that an Epidemic Phenomena shock (here COVID-19) is an external shock that will affect demand for oil and cause a decrease as a result of restricting on economic activity and consequently lower crude oil prices. For the SVAR model to be applied, the rank of the SVAR model equations must be determined by two tests (Lutkepohl, 2004): AIC- Akaike information criterion and SIC - Schwarz information criterion.

## 9.2. DATA USED

## 9.3. Results

### 9.3.1. Stationary test results

**Table 1: unit root test (PP)**

| UNIT ROOT TEST TABLE (PP) Phillips–Perron test | | | |
|---|---|---|---|
| | | At Level | |
| | | C_19 | OIL |
| With Constant | t-Statistic | 1.9872 | -0.4071 |
| | Prob. | 0.9998 | 0.9016 |
| | | no | no |
| With Constant & Trend | t-Statistic | -0.6141 | -1.9246 |
| | Prob. | 0.975 | 0.6313 |
| | | no | no |
| Without Constant & Trend | t-Statistic | 3.0975 | -1.7581 |
| | Prob. | 0.9994 | 0.0748 |
| | | no | * |
| | | | |
| | | At First Difference | |

| | | d(C_19) | d(OIL) |
|---|---|---|---|
| With Constant | t-Statistic | -13.065 | -9.2962 |
| | Prob. | 0.0001 | 0 |
| | | *** | *** |
| With Constant & Trend | t-Statistic | -14.9032 | -9.233 |
| | Prob. | 0.0001 | 0 |
| | | *** | *** |
| Without Constant & Trend | t-Statistic | -12.2766 | -8.929 |
| | Prob. | 0 | 0 |
| | | *** | *** |

Notes: (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1% and (no) Not Significant

**Table 2: unit root test (ADF)**

| UNIT ROOT TEST TABLE (ADF) augmented Dickey-Fuller | | | |
|---|---|---|---|
| | At Level | | |
| | | C_19 | OIL |
| With Constant | t-Statistic | 3.0679 | -0.4608 |
| | Prob. | 1 | 0.8919 |
| | | no | no |
| With Constant & Trend | t-Statistic | 1.1191 | -1.9833 |
| | Prob. | 0.9999 | 0.6002 |
| | | no | no |
| Without Constant & Trend | t-Statistic | 3.9638 | -1.7581 |
| | Prob. | 1 | 0.0748 |
| | | no | * |
| | At First Difference | | |
| | | d(C_19) | d(OIL) |
| With Constant | t-Statistic | -8.8223 | -4.5879 |
| | Prob. | 0 | 0.0004 |
| | | *** | *** |
| With Constant & Trend | t-Statistic | -10.0031 | -4.5287 |
| | Prob. | 0 | 0.0028 |
| | | *** | *** |
| Without Constant & Trend | t-Statistic | -11.8008 | -4.3381 |
| | Prob. | 0 | 0 |
| | | *** | *** |

Notes: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1% and (no) Not Significant

Unit root test results show that both series are stationary at first difference according to PP and ADF tests, so we can use SVAR to examine the relationship between COVID-19 and Oil price.

### 9.3.2. Evaluating the SVAR Model;

Table3 shows the results of structural VAR estimates between COVID-19 and Oil price

### Table 3: Structural VAR Estimates

| Structural VAR Estimates | | | | |
|---|---|---|---|---|
| Included observations: 70 after adjustments | | | | |
| Model: Ae = Bu where E[uu']=I | | | | |
| Restriction Type: short-run pattern matrix | | | | |
| A = | | | | |
| 1 | 0 | | | |
| 0 | 1 | | | |
| B = | | | | |
| 1 | C(1) | | | |
| 0 | 1 | | | |
| | | | | |
| | Coefficient | Std. Error | z-Statistic | Prob. |
| C(1) | -0.584422 | 0.119523 | -4.889627 | 0.000 |

The results of the structural Autoregression model show that there is a negative impact of corona case shock on crude oil prices, that is the shock parameter has a negative signal and is significant at a level less than (0.01).

As shown in figure (4). , Response of DC to Cholesky One Standard Division (SD) Innovations When a shock of rises in the number of cases by one standard deviation on the price of crude oil, the immediate adverse effect of this shock on oil prices becomes clear and this effect extends for several days (4 days) and then fades away.

### Figure 4 Response of DC to Cholesky One S.D. Innovation
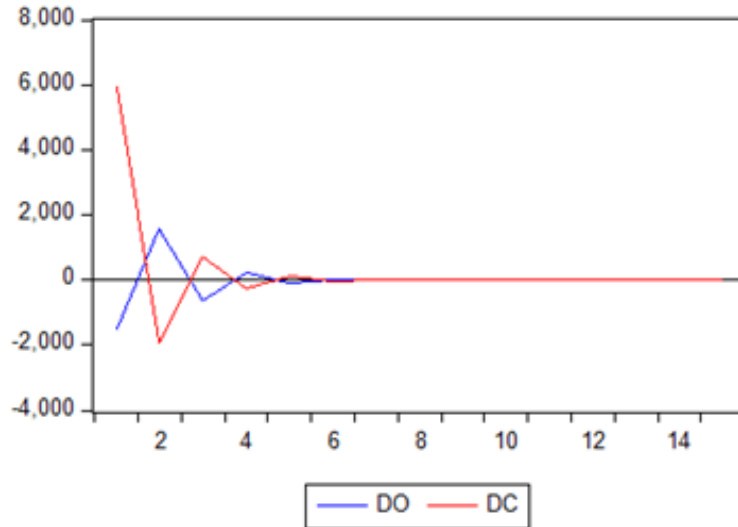
## 10. Conclusions and Recommendations

### 10.1.   Conclusions

- Globalization made the transmission of crises much faster with a more dramatic effect on both financial and real sectors, globalization in production made it much easier for COVID-19 to go from being just a national health crisis to a global health pandemic with a very deep effect.
- Global oil demand will remain in its current decline with possibilities of long-term contraction.
- The epidemic had a big impact on the movement of investments and their distribution between countries. As the stock markets witnessed the exit of many foreign investments that were established in the last period in China, which could be an opportunity for new countries to attract investments.
- The structural Autoregression model results show that there is a negative impact of COVID-19 cases shock on crude oil prices, the immediate adverse effect of this shock on oil prices becomes clear with a clear effect extends for several days (4 days) and then fades away.

### 10.2.   Recommendations

- In the current crisis, the international community needs to cooperate and coordinate Their efforts through the current scarce resources by creating appropriate urgent economic rescue packages to push global demand and supply and create the appropriate mechanisms to meet looming financing gap which will be reflected on the possibility of slipping many countries into debt distress in economies that are already racked up

as a result of 2009 crisis so much debt they are now at high risk of being unable to pay it back, including those that were badly hit by the epidemic or affected by low income.

- Cut down the domestic interest rates, but this measure should be followed by appropriated fiscal facilities.
- International financial institutions like WB and IMF have to ease conditionality that will delay any urgent financing instruments and funding needed to pass the current crisis with new programs designed to counter current situation with customized debt relief programs.
- Oil-producing countries, mainly OPEC+, have to take a quick action to reduce their daily production to suit the drop in oil demand that was caused mainly by urgent measures that were taken by countries to face COVID-19. The decline will not restore its previous levels after exceeding the crisis due to the long-term damage to the overall economic activities of small, medium and even large enterprises.

## References

Aiginger, K. (2010). The Great Recession versus the Great Depression: Stylized Facts on Siblings That Were Given Different Foster Parents. Economics: The Open-Access, Open-Assessment E-Journal, 4(2010–18), 1. https://doi.org/10.5018/economics-ejournal.ja.2010-18

Ajami, R. (2020). Globalization, the Challenge of COVID-19 and Oil Price Uncertainty. Journal of Asia-Pacific Business, 21(02), 1–3. https://doi.org/10.1080/10599231.2020.1745046

Albulescu, C. T. (2020). Coronavirus and oil price crash. SSRN Discussion Paper Series, 1–13.

Anderson, R. M., Heesterbeek, H., Klinkenberg, D., & Hollingsworth, T. D. (2020). How will country-based mitigation measures influence the course of the COVID-19 epidemic? The Lancet, 395(10228), 931–934. https://doi.org/10.1016/S0140-6736(20)30567-5

Arturo, M., Estrada, R., & Park, D. (n.d.). The Economic Impact of Massive Infectious and Contagious Diseases : The Case of Wuhan Coronavirus. 1–18.

Atanasov, V., & Nitschka, T. (2013). Currency excess returns and global downside market risk. Journal of International Money and Finance, 47, 268–285. https://doi.org/10.1016/j.jimonfin.2014.06.006

Ayittey, F. K., Ayittey, M. K., Chiwero, N. B., Kamasah, J. S., & Dzuvor, C. (2020). Economic impacts of Wuhan 2019-nCoV on China and the world. Journal of Medical Virology, 473–475. https://doi.org/10.1002/jmv.25706

Baker, S. R., Bloom, N., Davis, J., Kost, K., Sammon, M., & Viratyosin, T. (2020). The unprecedented stock market reaction to Covid-19. In PANDEMICS: LONG-RUN EFFECTS effects (DP 1453; CEPR Discussion Paper, Vol. 1, Issue DP 14543).

Baldwin, R., Weder, B., & Mauro, D. (2020). Economics in the Time of COVID-19.

www.cepr.org

Binder, C. (2020). Coronavirus Fears and Macroeconomic Expectations. SSRN Electronic Journal, 1–22. https://doi.org/10.2139/ssrn.3550858

Easterly, S. R. (2009). ASSESSING THE RELATIONSHIP BETWEEN TRADE AGREEMENTS AND FOREIGN DIRECT INVESTMENT [Georgetown University]. In Georgetown University. https://doi.org/10.1017/CBO9781107415324.004

Eggertsson, G. B., & Egiev, S. K. (2019). Fundamental Driven Liquidity Traps : A Unified Theory of the Great Depression and the Great Recession. 1–97.

Evans, D. K. (2014). The economic impact of the 2014 Ebola Epidemic: short-and medium-term estimates for West Africa. World Bank Group.

Evans, O. (2020). B i z econs Q uarterly. 7, 3–12.

Farrell, H., & Newman, A. (2020). Come Home. Foreign Affairs, 99(Vol. 99, No. 2), 116–127. https://books.google.com.br/books?id=Z8KOQQAACAAJ

Fetzer, T., Hensel, L., Hermle, J., & Roth, C. (2020). Perceptions of Coronavirus Mortality and Contagiousness Weaken Economic Sentiment. http://arxiv.org/abs/2003.03848

Fornaro, L., & Wolf, M. (2020). Covid-19 Coronavirus and Macroeconomic Policy : Some Analytical Notes. March, 1–8.

Gabriel Casillas. (2020). Global market rout triggers an expansion of the FX NDF program. Economic Research, 1–6. www.banorte.com

Gertler Mark, & Gilchrist, S. (2018). JEP Macro after the crisis. The Journal of Economic Perspectives, 32(3), 3–30. http://www.aeaweb.org.

Gita Gopinath. (2020). Transcript of April 2020 World Economic Outlook Press Briefing. IMF. https://www.imf.org/en/News/Articles/2020/04/14/tr041420-transcript-of-april-2020-world-economic-outlook-press-briefing

Gonçalves-Sá, J. (2020). In the fight against the new coronavirus outbreak, we must also struggle with human bias. Nature Medicine, 26(3), 305–305. https://doi.org/10.1038/s41591-020-0802-y

Hanna, D., & Huang, Y. (2004). The Impact of SARS on Asian Economies. Asian Economic Papers, 3(1), 102–112. https://doi.org/10.1162/1535351041747978

Illing, M., & Liu, Y. (2003). Measuring Financial Stress. Financial System Review, 43–48.

IMF. (2020). Policy Steps to Address the Corona Crisis. imf.org.

Ivana, B., & Ondřej, D. (2020). Zombies: Who are they and how do firms become zombies? Journal of Small Business Management, 58, 1–27. https://doi.org/10.1080/00472778.2019.1696100

Jang, P. Y., & Beruvides, M. G. (2020). Time-Varying Influences of Oil-Producing Countries on Global Oil Price.

Khadim, H. L. (2020). Iraqi Economy in the Time of Coronavirus. In Policies of Iraqi Macro Economics (Vol. 2). http://iraqieconomists.net/

Kim, S., & Roubini, N. (2000). Exchange rate anomalies in the industrial countries: A solution with a structural VAR approach. Journal of Monetary Economics, 45(1), 561–586.

Kingsly, K. M., & Henri, K. (2020). When China Sneezes the world catches a cold-CEMAC When. 1–4. https://www.linkedin.com/in/kelly-kingsly-ph-d-2a5a1416

Kollmeyer, B. B. (2018). bubble brewing in U.S. household wealth. MarketWatch, 1–6. https://www.marketwatch.com/story/analyst-who-predicted-the-2008-crash-warns-of-bubble-brewing-in-us-household-wealth-2018-10-18

Kose, M. A., Nagle, P., Ohnsorge, F., & Sugawara, N. (2020). Global Waves of Debt: Causes and Consequences.

Last, J. M., & Adelaide, D. P. (2013). The iceberg: "completing the clinical picture" in general practice. 1963. International Journal of Epidemiology, 42(6), 1608–1613. https://doi.org/10.1093/ije/dyt113

Levendis, J. D. (2019). Springer Texts in Business and Economics. Springer US.

Lutkepohl, H. (2004). Applied Time series Econometrics ( cambridge university Press (ed.); second edi). Helmutlu Tkepohl, Markus Kratzig, Cambridge University press.

McKibbin, W. J., & Fernando, R. (2020). Centre for Applied Macroeconomic Analysis (19/2020; CAMA WP).

Metcalf, T., Witzig, J., Maloney, T., Musk, E., & Diabetes, Y. H. (2020). World's richest lose $ 444 billion after hellish week for markets. The Economic Times, 2–3. https://economictimes.indiatimes.com/markets/stocks/news/worlds-richest-lose-444-billion-after-hellish-week-for-markets/printarticle/74412355.cms

Negus, K., & Pickering, M. (2004). Scholar (11). In Sage.

Organization, W. H. (2020). Coronavirus disease 2019 ( COVID-19): situation report, 49.

Ozili, P., & Arun, T. (2020). Spillover of COVID-19 : impact on the Global Economy. https://ssrn.com/abstract=3562570

Pan, L. (2006). The Inverted Yield Curve : Historical Perspectives and Implications on Cash Portfolios. Interest Rate Strategy, CAG 7, 1–7. www.capitaladvisors.com

Pelletier, F. (2017). It takes two to tango. Nature Ecology & Evolution, 1(1), 34. https://doi.org/10.1038/s41559-016-0034

Raduzzi, R., & Ribba, A. (2020). The macroeconomics outcome of oil shocks in the small Eurozone economies. The World Economy.

Rees, M. J. (2003). Our final hour: a scientist's warning: how terror, error, and environmental disaster threaten humankind's future in this century--on Earth and beyond. In Choice Reviews Online (Vol. 41, Issue 02). Basic Books New York, NY. https://doi.org/10.5860/choice.41-0896

Rich, B. (2020). Book of Billionaire Secrets. 1–30. http://info.forbes.com/rs/790-SNV-353/images/Billionaires_Secrets.pdf?mkt_tok=eyJpIjoiWVRkbU1qUmhOV0ZsWWT JSbCIsInQiOiJtSVRpa29IVG1uREtLRStrdzZqWVN5bTJXcXddSZGxhWStuNWR MZmo2dGZ2UkpqqR29tQm3Nll2N2pEcUpSenpaRkdONGFsSHJBNmVcLzhiZH

A5NEpWUnZ4SWxWdU5OdzZ5bndGaFg1R

Ruiz Estrada, M. A., Park, D., & Lee, M. (2020). The Evaluation of the Final Impact of Wuhan COVID-19 on Trade, Tourism, Transport, and Electricity Consumption of China. SSRN Electronic Journal, 1–13. https://doi.org/10.2139/ssrn.3551093

Sharma, R. (2020). This Is How the Coronavirus Will Destroy the Economy. The New York Times. www.nytimes.com/2020/03/16/opinion/coronavirus-economy-debt.html?action=click&module=Opinion&pgtype=Homepage

Simon P. Lloyd. (2019). Cambridge Working Papers in Economics. In Cambridge-INET Working Paper Series: Vol. 2019/22.

Simulation, E., Modeling, P., Author, C. F., Arturo, M., Estrada, R., Author, S., & Koutronas, E. (2020). The Application of the 2019-nCoV Global Economic Impact Simulator ( the 2019-nCoV-GEI-Simulator ) in China. 14(Cdc), 2–14.

Smith, C. (2020). US yield curve inversion raises growth concerns. Financial Times, 10–12. https://www.ft.com/content/e225cd10-4395-11ea-a43a-c4b328d9061c

Uhlig, H. (2005). What are the effects of monetary policy on output? Results from an agnostic identification procedure. Journal of Monetary Economics, 52(2), 381–419. https://doi.org/10.1016/J.JMONECO.2004.05.007

Use, O., Iinot, O., Public, F. O. R., & Or, D. (2020). PanCAP Adapted U . S . Government TH.

Webster, P. (2019). World Report Canada and COVID-19 : learning from SARS. The Lancet, 395(10228), 936–937. https://doi.org/10.1016/S0140-6736(20)30670-X

Whitworth, J. (2020). COVID-19: a fast evolving pandemic. Transactions of the Royal Society of Tropical Medicine and Hygiene, 1–2. https://doi.org/10.1093/trstmh/traa025

World Health Organization, W. (2020). WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020. WHO Director General's Speeches, March, 4. https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020

Yilmazkuday, H. (2020a). Coronavirus Disease 2019 and the Global Economy. 2019(March), 1–17.

Yilmazkuday, H. (2020b). COVID-19 E ¤ ects on the S & P 500 Index. 2019, 1–13.

Yu, K. D. S., & Aviso, K. B. (2020). Modelling the Economic Impact and Ripple Effects of Disease Outbreaks. Process Integration and Optimization for Sustainability, 1–4. https://doi.org/10.1007/s41660-020-00113-y