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# SYNERGY

Bilkent Energy Policy Research Center Newsletter

Energy Policy Research Center

## The Anatomy of Negative Oil Prices


Last week was a historic week for oil prices. We have seen negative oil prices for the WTI future prices. It wasn't the first negative oil price, there were some marginal crude blends seeing negative numbers. On the products side, there were some occurences of negative valuations. Before giving conclusions, we have to understand what has happened at the technical level.

On April 8th, 2020 CME Group has published an advisory notice titled "CME Clearing Plan to Address the Potential of a Negative Underlying in Certain Energy Optons Contracts". The notice summary includes a part with "if major energy prices continue to fall towards zero in the coming months...". So if someone has the right to claim an advance foresight of negative oil prices, it should be CME Group.

According to CME's "Crude Oil Futures Calendar" the settlement date for the May contract is 21st April 2020. For those of you expecting another wave of negative prices, the next settlement is on 19th May 2020. The options contract settle on the 14th May 2020. Future contract's delivery procedure states that "Delivery shall be made free-on-board (F.O.B.) at any pipeline or storage facility in Cushing". That leads to "physical delivery" obligation of the contract if you do not roll.

In the most basic level, on the last day of the settlement of May 2020 WTI oil futures contract, the final contracts of that day fall to negative territory. There may be several reasons. The foremost of it is due to physical settlement nature of the contracts. When you do not want a physical settlement and you can not find a counterparty to buy your contract, the price of the contract further aways from the physical oil price and reflects storage costs of that time.

We get used to abundance and scarcity of oil and relevant oil prices. But we have never seen the scarcity of "storage space" before. Although the storages were not full, they were booked. There is always the possibility of storage owners' intention to squeeze the market. Scarcity may pave the way for exercising market power, whether it is oil or storage it does not matter.

So there is a coupling of oil market with storage at the last day of thensettlement. Then comes the next question. Can we conclude that there was a market manipulation or malfunctioning computer algorithms? This may not be easily concluded. On CNBC, CME Group chief Terry Duff says there were around 154000 contracts on Monday, less than 80 of them settled at zero price, 10% settled at negative prices. Duff asks "why the oil industry didn't buy this negatively priced oils if it worth more?". This legitimate question brings us to the main question.

Duff puts a simple logic : "why did it go below zero? because no one was willing to step up and take that product at the price of zero because they knew their costs would be

higher than that".

The second issue is about US Oil Fund. The fund has already rolled its May presence before the historic Monday. The fund was a heavy weight in the market with a share of 20-27% of futures oil contracts. Their departure from May contract may have dried up the liquidity for May contracts but USO publishes its movements beforehand.

After the historic crash, on the 23rd April, CME has imposed new position limits on the contracts. USO's positions in June contracts most probably was over that limit. And within a week they changed their positions 2 times and reported to SEC. As of today, USO has filed another 8K to the Securities and Exchanges Commission about their position limits. This time the contract diversity included even June 2021. The new portfolio is July 30%, August-September-October-November-December 10% each and July 2021 10%. The new position will be rolled into within these 3 days: 27-28-29 April. The next three days will be shaky too. But then some stability from the ETFs side will be provided. We will see the bare force of fundamentals then.

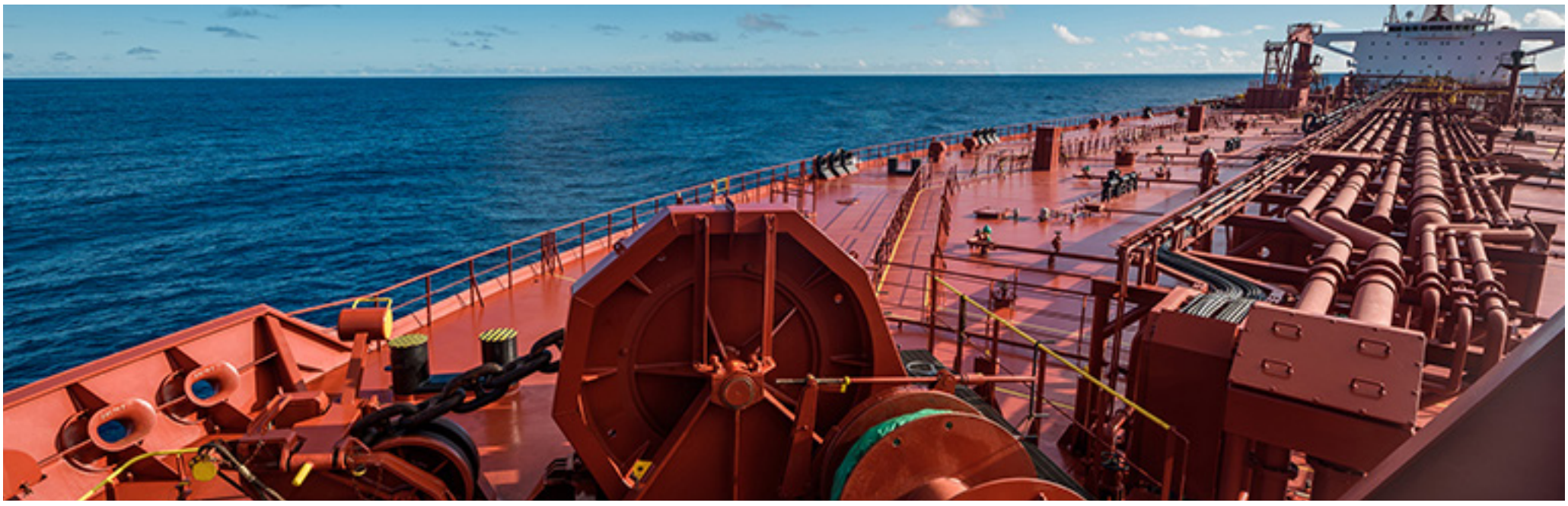
After these position moves, we will see whether negative prices will repeat or not. According to CME group negative prices are always a possibility and part of market functioning. The negative prices will be determined by two things: the hedge positions of the producers and storage costs or storage limits of the next month. If oil production was flexible enough we may not have seen negative prices.
The main message from last week was how pricing regimes work and at which boundaries these regimes couple with other markets. As in the oil prices, specifically about a physical settlement contract, after a certain range prices should reflect storage costs. That is not a surprise, however if the other coupled market -storage/pipeline/tankers – is in scarcity that may show symptoms of manipulation through exercising market power.

One last issue is probably the amateur investors, who were not aware of the physical settlement of the contracts. According to Bloomberg, some Chinese investors woke up with obligation to pay over their contracts after Monday's negative prices. Some brokage firms has declared losses. Trafigura and Carl Icahn has declared that they bought some of this negatively priced oil. The most famous professional oil trader Pierre Andurand find these times "very dangerous".

The leading academic expert on the financial sides of oil markets, Dr Bahattin Büyükşahin has told us some important conclusions from previous episodes. The herding is real, these markets are for price discovery they may not reflect real prices. And during times like these, these effects may amplify and may go astray. 20th April 2020 may be a historic moment but will not be an exception.

Barış Sanlı

# The US-Bound Saudi Tanker Fleet



The fleet of Very Large Crude Carriers (VLCC)'s that number around 20, which are estimated to be carrying 50 million barrels of oil, has stirred up a controversy in the United States. In an already flooded market with logistical constraints, the question of where the incoming oil will go has dominated the headlines recently. Calls from U.S. senators for the application of import tariffs against the Saudi Arabian oil has been gaining traction amongst the mainstream media but as moderate of a measure it may seem, the inner workings of where the case may go create a different picture.

Firstly, with no official confirmation as to whether the oil has already been sold or not to designated buyers, the tankers are currently heading towards the Gulf of Mexico. Within the GoM is situated the Motiva Refinery, the largest of its kind and one of the most complex and flexible facilities in the region.

Motiva is one of the largest processors of crude in the area and has a competitive edge when it comes to petroleum products. The proposed tariffs would indirectly negatively impact the U.S. refiners because Motiva is situated in the Texas Port Arthur Free Trade Zone (FTZ). In the FTZ, the oil would not be subject to any customs fees/tariffs, and the oil could be unloaded at the port, processed, and then shipped out to regions where the other GoM refiners have their target markets in. With the added advantage of Motiva's flexibility, the other refiners in the region would be at a significant disadvantage in cost terms. They could risk being driven out in the short time.

The case Saudi's seem to want to make here is to have the oil in the shore sitting in the VLCC's and unloading them as demand generates where they would be offsetting any bids from the onshore producers. This would significantly bottleneck the U.S. shale flow towards the refineries and create a massive backlog. Also at this point, it is highly unlikely that the Motiva refinery might be pulled off production for maintenance because the oil demand it would remove the market would be significantly less impactful than having it process and push for lower prices with added constant supply from the fleet sitting on the shore if hurting the American oil industry is their aim.

An interesting detail in the region is the Big Hill Strategic Petroleum Reserve. The SPR had received FTZ status in 1998, and depending on the negotiations between the U.S. and Saudi Arabia, if the price or the outcome is justifiable enough, some of the oil on the fleet could be used to fill the SPR'S to prevent any immediate shock to the market.

The unofficial statements also mention that some of the oil on the fleet has already been sold to U.S. refiners, including Exxon Mobil, Marathon Petroleum and Phillips 66. At this point, it seems likely that the application of tariffs against the Saudi oil imports would hurt the U.S. more than it benefits while also potentially knocking out the oil and gas jobs in the region.

Whatever the outcome may be, the Saudi fleet is unlikely to turn back unless a special accord is reached between the U.S. and Saudi Arabia. It will likely exert added pressure in the upcoming days on the U.S. market and should yield an interesting result in terms of balancing the current erratic market movements.

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| BRENT OIL | 22.96 $/BL | GASOLINE | 5.26 ₺/LT |
| USD/TRY | 6.99 | DIESEL | 4.91 ₺/LT |
| EUR/TRY | 7.59 | FUEL OIL | 2.21 ₺ |

# Documentary Review: Planet of the Humans


Planet of Humans is a documentary that was presented by Michael Moore and directed by Jeff Gibbs. In this one and a half hour, long documentary Moore and Gibbs talk about the dark side of renewable energy and its negative effects on the environment.

People tend to believe that anything renewable is good; however, this document shows that renewable energy resources harm the environment as much as non-renewable energy recourses, if not more. Manicuring process of renewable energy producing items, their expected life, and productivity analysis are explained throughout the documentary.

In addition to scientific reports that they indicate, documentarians also show numerous interviews with environmentalists, experts and businessmen's. These interviews not only clearly show the differences of opinion between experts and the majority of businessmen, but it also reveals the lack of information about renewable energy production. Towards the end of the documentary, documentary makers show that majority of the renewable energy sector is funded by famous beverage, food chain companies, banks, timber, and non-renewable energy companies.

It also shows that the majority of politicians and environmentalist lacks the necessary information about green energy production. Moore and Gibbs divide renewable energy resources into two categories and focuses them separately. In the first part of the document, when they talk about the green energy movement, they focus on solar energy windmills. In the second part of the documentary, they concentrate on biofuel energy.

These parts can be summarized under five headings.

1. Renewables like solar panels and windmills are intermittent, which means they cannot be seen as reliable continuous energy providers.

A cloud can cover the sun; it may start to rain or wind blowing may stop in that case your solar and wind generation will significantly decrease. To compensate for the power outages, you have to have a backup system or a generator. Because these systems cannot store enough energy to counterbalance one household's daily needs. Energy storage systems have less than 10% of the needed amount (according to International Energy Agency's data global battery capacity is 54 Giga btu meanwhile global annual energy use is 546.000.000 Giga btu).

Therefore we can easily say that it's almost impossible to switch to 100% green energy. In the time of technology, even the amount of electricity required for our technological items to keep operate is quite a lot. During the covid'19 pandemic, people started to use their electrical items even more. In the case of such emergencies or crisis, renewable energy sources cannot be seen as a reliable solution.

2. You need suitable platforms to implant solar panels and windmills; to do that, states tend to coverntrize forestall eras.

Lowel Mountain case was given as an example in the documentary. Part of the mountain got deforested for the installation of 21 windmills. The life of these windmills are approximately 20 years, and their lifetime long carbon reduction can only compensate a year of carbon sequestration done by the trees demolished for the windmill construction.

For windmills –just like other renewable energy production systems- power plants should be backed up and idle with fossil fuels all the time because if the system continuously cycles up and down as the demand of winds comes through, then it generates a bigger carbon footprint. As another example in the Mojave Desert, Joshua trees were torn down to create spaces for solar panels implementations.

3. Construction of renewable energy systems requires lots of rare earth minerals, which significantly harms the environment because of their carbon emission.

Some solar panels only last up to ten years. In general, solar and wind technology installations can only last a few decades than they needed to be torn down and replaced by the new ones. It takes a lot of energy to mine and process materials. For more solid examples, the production of windmills can be giv-

en. To maintain its fundamental components, usually, high-quality quartz and coal are used. These components are furnace up to 1.800 degrees to get the silicon metal that you need for the windmill production. However, this reaction reveals large amounts of carbon dioxide.

Lithium is classified as a toxic mine, Graphite, which is another form of carbon, and they both heavily used in the renewable energy systems manufacturing process. Uranium, Thorium, Cobalt, Coal, Steel, Nickel, Sulfur, Silver, Hexafluoride (which is 23.000 times worse than CO2), Copper, and other radionuclides can be given as an example to rare earth minerals which was used by the sector after these mines were extracted radioactive waste debuts. Instead of disposing of these leftover minerals and toxic materials, firms tend to left them out on nature.

As I mentioned in my previous writings, rare element mining is a problematic issue. In addition to environmental concerns, it leads to the exploitation of certain groups and/or nations. It creates not only developmental injustices but also violates human rights due to working conditions in many mines. Time to time, people –especially the natives- are forced out of their lands for the exploitation of the mines.

4. Renewable energy systems cannot maintain functioning without the support of non-renewable energy.

The clean tech revolution is not that clean as it sounds—for instance, electric cars. Manufacturers tend to introduce them as cars powered by wind or sun energy, but in reality, they use the electricity from the grid.

People hardly ever question the main source of that grid. Usually, electric cars use city grids, which is mostly provided from non-renewable energy resources.

Alternative energy sources, aka green energy, is not that different than fossil fuels. Renewable energy production and storage systems increase carbon footprint with a mass scale implication.

Solar gas facilities burn natural gas almost every day to get the energy that they need to start up their productions. In the documentary, Ozzie Zehner indicated that by using non-renewable energy sources to gain clean energy, we are using and losing more non-renewable energy. In another saying, by burning fossil fuels instead of using them in renewable energy facilities, we can get a better yield.

If these renewable energy facilities were 100% eco-friendly, they would not have to fill acid rain permits for nitrous oxide emissions, or they did not have to apply for carbon offset permits. They need to offset the carbon dioxide that they produce as a result of their chain of action to assemble renewable energy.

There is no facility runs by 100% renewable energy (wind and sun); they all keep their grid connections, and to continue operating, they have to do that. As it's indicated in the documentary, the sun can be renewable, but it's not accessible all the time, and solar arrays are not renewable at all.

5. Biomass harms nature as much as other green energy sources.

Biomass has the highest share among the green energy providing systems, yet it's one of the most none-ecofriendly energy providers. In the documentary, Moore and Gibbs give the example of McNeil Biomass power plant where they burn trees ( approximately 400.000 tons of trees per year) to produce electricity, in addition to natural gas that they use to support their energy production.

Along with deforestation, the carbon footprint created during the cutting down these trees and transporting them from the forests to these power plants significantly harms the environment. Some biomass plants use artificial subsidies to increase the temperature that they get from burning the trees like tire chips. These substitutes contribute to air pollution drastically.

To cut a long story, short none of these renewable energy facilities are not carbon neutral. None of the green energy providers can sustain its operations without the support of non-renewable energy sources. They all pollute and harm the environment as much as, maybe more than non-renewable energy resources.

Yüksel Yasemin Altıntaş

# A Short Analysis : Impact of Corona on Shale Producers

Throughout history, the world faced numerous challenging catastrophic events, and always there occurred both winners and losers. When COVID 19 examining, today, data shows that this pandemic will have an end, and all markets will turn back their equilibrium soon. Many experts state that this crisis is a short term crisis; however, consequences will last long.

From the perspective of Chomsky, who is well-known philosopher, humanity has sufficient information to control COVID 19 and thanks to this, although there are criminal outcomes of the event, everything will be fixed. Examining his view, today, China has proved these ideas.

It is an indisputable fact that COVID 19 can be controlled and has an end when the situation in China is considered, even though the high population rate, the spread of COVID 19 is stopped. However, what will happen to the economy during this period has great importance, especially analyzing the energy market, the sector which shapes the world economy.

Saying that big fish eat small fish is an appropriate sentence to summarize the situation when shale gas producers are considered. About the fall in the oil prices, Vladimir Putin stated that “are great because they will damage U.S. shale.” (Mills, 2020).

What could be inferred that is crystal clear, Russian oil companies will not be harmed. However, whether the damage which Putin states could bring the end of shale producers or not is a questionable phenomenon when their market structure is taken into account. Since shale producers are small entities comparing with the sector leaders such as Exxon Mobile, Saudi Aramco, iron out the consequences of COVID 19 could be thorny for these little fishes in the energy sector.

The sharp demand shock has led to these bizarre prices. International Energy Agency suggests that oil demand has decreased the merest by %20 owing to COVID 19 precautions.

Consequences of these are catastrophic for fracking companies since at least they should earn $30 per barrel so that these companies could make a profit. The vast amount of fracking companies has halted the production in April due to stringent prices, and this could terminate them because of their considerable amount of debts.

According to analyze which is made by Rystad Energy, the total liability of shale producer is $133 billion U.S. dollar, and the deadline for payment is due 2026. If prices continue to shrink, bankruptcy is inevitable for shale producers. Implying monetary policy and targeting banks may be a remedy for fracking companies; however, the U.S. prefers to suggest fiscal policies to deal with the COVID 19 crisis.

When shale producers have entered the market, oil prices have fallen drastically. Due to this, sector leaders’ profit has decreased. Typically, there could be intentions to get shale producers out of the market, considering the marginal benefit of those giant energy producers. Flies are small insects, but their voice disturbs us, and this example could be valid when the impact of shale producers is examined.

In the past, there were attempts to put shale producers out of business, but this was not be achieved according to Marking, who is a lawyer in U.S.

However, thereby COVID 19 crisis, the majority of shale producers could exit the market with natural ways. Livingston, who is an expert in Eurasia Group, suggests that “I don’t think it’s a death knell, but it’s an inflection point for this industry” (Mcdonnel, 2020).

Also, according to him, shale production will continue to exists. However, big companies will become the owner of those small entities. Examining his view, when their enormous debts are taken into account, and many producers stopped their production, owners of small shale production companies could change.

Some researchers suggest that when COVID 19 spread is once stopped, countries, especially China, will increase production enormously. If this situation occurs, usually demand for oil and gas will sharply increase because the primary consumer of oil and gas is factories.

To overcome a recession, consumption is prompt by governments, and thanks to this supply side of the economy could increase their production. Also, the majority of factories halt the production to prevent the spread of the virus, and goods are sold from storage; thus, to make storage and turn back to normal production will increase.

Thanks to these, the demand for oil and gas could increase drastically, and the price could be normal again. Even, there could be a supply shock of oil and gas due to cuts in production. If this scenario occurs, shale producers could restart the production, and they can smooth away the situation.

Briefly, according to well-known philosopher Kant, thinking optimistic when misfortune events occur is our duty as humankind—from this angle, analyzing the situation as catastrophic makes the economic crisis worsen.

Likely the whole of the crisis, this also has an end, especially China's case is considered. The spread of this disease will be controlled, and its negative impact on the economy will be short term. Thus, oil and gas prices will turn it's normal eventually. Although the situation is not pleasant for shale gas producers due to their loss of profits and debts, if the spread of the virus stops this summer, they could also overcome the crisis.

Işık Zeynep Cebe

# COVID-19 and Iran Sanctions


Iran is one of the countries that has been affected by COVID-19 pandemic. As of today, there are 91,472 active cases and 5,806 deaths.

Although it has been said that economic sanctions are the most harmless way of applying pressure, the shortages of medical equipment cause many lives that could have been saved with humanitarian help.

Last month, the Iranian government had called $5 billion from the IMF for financing Coronavirus expenses and asked for international support to lift the U.S. sanctions.

Washington, on the other hand, does not have any motivation for easing the sanctions, yet they are content with the medical supports. A delivery from Switzerland on medical tools arrived in Iran. However, when we think about the scale of the country, these supports are far away from sufficient while the pressure on the Iranian economy resumes

On the Iran-China relations, we see a significant decline in the trade values. It is said that in the first quarter of 2020, Iran's exports to China dropped by 52.7%. When these trade declines also combine with Coronavirus and low oil prices, it creates a significant burden on the Iranian economy.

Two weeks ago, the Iranian government decided to sell 10 percent of the shares of Shasta, which is the wealthiest state-run holding company, to balance the expenses to some degree.

Despite all the setbacks, Iranian officials are continuing to support their allies. According to a Bloomberg report, last week, they sent gasoline blendstock and technicians to support operations on Venezuela's Amuay refinery, which is one of the biggest in the world. Now, the Venezuelans are also considering buying gasoline which is sold $10 for a gallon at the moment within the country.

Military developments are also continuing. On the weekend, the Iranians launched their first military satellite. Last week, Donald Trump said that any hostile activity against Americans in the Hormuz Strait would not be tolerated.

Under the light of these developments, we can say that the American pressure on the Iranian government continues despite the Coronavirus. Yet, the Iranians are also finding alternative ways to deal with the sanctions. The upcoming American elections will determine the future of the American sanction policy.

Gökberk Bilgin

# The Role Of Mining In Economy After Covid-19

The role of mining in the economicdevelopmentofmany countries can not be ignored. When we look through history, it can clearly be seen that the most powerful economies and the highest level of welfare belong to the countries which have the most powerful mining activities. It is not only because of the efficient usage of natural resources in countries but also because it helps create social growth policies in developing countries.

Without mining activities, we can'tthinkabouttheautomotive industry, construction industry, or technological devices that we use to ease our daily life. Because mining is the base of these sectors, it provides raw material to those sectors.

While mining has a vital role in the economy, it's not easy to process. Stages of mining (extracting ore and mineral processing) require really hard work and manpower. Even though necessary precautions are taken in the plants, when we consider the current situation that the whole world is facing right now, we can see that more precautions should be taken.

A lot of mineworkers' accommodation is usually inside the plant, and it's provided by the mine companies. Because of environmental issues, mining institutions must be far away from the city, which makes the plant some kind of a village to workers that they have to live. That leads to an increase in time workers spent together.


Change of price of gold since Covid-19 pandemic

When authorities analyze all the circumstances in the sector, they have decided to shut down the mass production, which leads to supply chain disruptions. The ones that haven't been shutdown decrease the working hours and employment. Huge losses are expected in different income groups in future days.

These temporary or permanent pauses have different kinds of impacts on demands and prices. While demand for copper, nickel, and platinum decreased, prices have dropped in direct proportion to decrease of demand; precious metals like gold and silver increased their demand and price right from the start of the Covid-19 pandemic.

"The International Monetary Fund (IMF) believes that the virus will reduce global growth by 0.1% in 2020. China's growth could fall to 5.6%, which is 0.4% lower than the organization's January outlook. Meanwhile, Moody's Analytics believes that the outbreak could reduce U.S. growth during the first three months of 2020 by six-tenths of a point to 1.3%."

It's obvious that a difficult period is ahead of the mining industry and correlatively to the other industries as Covid-19's economic impact shaping up to be significant. Because not only workers and businesses are affected so the governments. With the rise of the price of gold and precious metals, the new economic model of the World will be specified.

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