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Brunt of Coronavirus in Oil Markets & 2020 Prices

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1. Introduction

Oil prices are one of the most important items affecting the trends in the global economy. In addition to global sights, being the price levels directly influencing the individual budgets and preferences, sociological impact reaches much higher levels than the expectations. That's why to have an idea about the tendencies and directions of the prices becomes much more important for the whole world (from individuals to the governments).

In order to make estimations for oil prices, initially we have to determine the roles and tendencies of main variables in the price equations. There are many different elements that are affecting the prices in the oil markets. To have a generalization, we can assume that;

- Supply demand balances, including: new discoveries, stocks, number of drillings, production levels, interruption decisions, long-term contracts, development declarations and etc.
- Economic trends, like: global economic growth, GDP rates, substitution markets, us dollar parity, alternative investment opportunities, purchasing power and etc.
- Risks, such as: perceptions, political tensions, terrorism, security issues, natural disasters, unusual factors, biological or chemical treats and etc.
- Black oil capacity and their prices.

are the main four categorized drivers in oil price equations. While sometimes, some of these elements have individual effects on the equation and sometimes they may also affect the other variables and have a bigger impact on the generalized equation. Such as, today's most popular issue: Corona virus!

Without any doubt, corona virus is one of the most influencing drivers of oil prices, seen in the history. Global oil demand decreased around %20 due to spread and uncontrollable risks of this epidemic treat and the prices collapsed around %50.

In this study, after shortly describing the main items affecting the oil prices, corona sight and the near future dynamics will tried to be analyzed.

2. Supply – Demand Side

Before the corona virus era, world was consuming around a 100 million barrels of oil per day. This means a very huge volume of economy. Some portion of this consumption (nearly %5) belongs to the unregistered black oil sales (which are mainly coming from Iran, Venezuela, Nigeria and Syria).

From the supply side of the equation; we are faced with very important suppliers, such as US, Saudi Arabia, Russia, Canada, Iran, Iraq, China, Kuwait, UEA, Brazil and etc., which are affecting the dynamics.

OPEC (may be we can say that OPEC+) as being an integrated group of producers, is the most influential structure in the supply side of the equation. Moreover, in the OPEC group, due to technical and financial capabilities and being the Saudi Aramco a governmental company, Saudi Arabia (SA) is the most influential actor in the supply policies. SA has the capability of having sharp export cuts or extra supplies to the markets which directly change all the balances.

From the demand side, USA and China are the two biggest consuming countries. That's why, the acts, declarations or decisions of these players directly affect the price balances of oil.

Supply and demand trends can be affected by many different strides, such as:

- New discoveries usually means extra supply of oil.
- Conversely, while there was an important expectation for a huge structure to bear billions barrels of oil reserves and after the tests, the results are nothing, then this situation means less supply by comparing with the expectations, which affects the prices in upward direction.
- Declared stocks are the other factors. The difference between the reality and the expected volumes of stocks are also important issues directing the short term prices. Hence being the biggest consumers, US's and Chinese stock levels' positions are directly affecting the prices. In addition to these, new infrastructures to increase the stock capacity will also change the prices.
- Number of drilling rigs and continuing drilling activities are also important for the supply side of equation. Hence more wells mean more production levels.
- Increase in the production levels or possible decreases due to technical / non-technical problems directly affect the supply side, proportionally to the capacity.
- Interruption decisions, such as OPEC's agreed volumes of supply cuts directly affects the prices.
- New long-term sale contracts, which means further agreed of supply and demand volumes also have an effect on the prices.
- New field development declarations of companies and FID agreements are the other important issues affecting the oil prices.

All different kind of factors directly or indirectly affecting the prices have to be considered in the analysis.

3. Economic Trends

Economic trends are also the other key drivers affecting the oil price. Global economic growth, GDP rates, substitution markets, us dollar parity, alternative investment opportunities, purchasing power and such economical facts have direct or indirect impacts on oil prices. For example:

- While the global economic growth is high, then the energy investments and indirect demand growth naturally be high.
- US dollar parity usually has a reverse acting tendency with oil prices. Hence, usually the brokers tend to cash out their shares in oil markets and put them in US dollar based stocks and bonds or vice versa according to their expectations. In this regard, FED's declarations have direct effect on the prices.
- Similar with the USD's situation, the same tendency occurs within the alternative investment opportunities while compared with oil markets.

4. Risks

There are also different kinds of risks affecting the oil markets, supply – demand balances and naturally the prices. For example:

- Perceptions sometimes may have resulted in higher effects on the prices while comparing with the reality. To give an example, after the negative results of the OPEC + meetings in the beginning of March 2020 (while the members couldn't agree on additional cuts to deal with the corona virus effects), initially Putin's and later Saudi Arabian's declarations made the prices collapse up to the 30 \$/bbl levels. In this concept, Saudi Aramco declared to sell crude oil to Chinese buyers with an additional 4 to 8 \$/bbl discount rates and to supply additional 2 million bbld (then 2,6 million bbld) to the global markets. In reality, neither agreed such a discount nor such an additional volume of supply applied. However, due to the perceptional effects of these declarations, the prices collapsed into the annual lowest levels. Moreover, after these acts, Trump declared some messages for both sides to agree on additional interruptions around 10 15 million bbld. And the prices (for Brent) jumped from 24 \$ levels to 34 \$'s. Although it is not possible to reach such cutting levels, the perceptions changed the dynamics. For all that, we are sure these perceptional effects are short termed.
- Political tensions, terrorism, security issues, natural disasters, unusual factors, biological or chemical treats and such force majeure issues are also other risk bearing items affecting the oil prices.

Black Oil

There is a huge volume of unregistered black oil sales in the global markets. Currently the origins of these volumes are mostly Iran, Venezuela, Nigeria, Iraq and Syria. The price levels of the black oil sales are usually 5 to 15 / bbl are lower than the normal registered volumes. That's why the volume of the black oil market directly decreases the price levels and supply expectations.

5. Corona Virus: A Versatile Sharp Effect on Oil Prices

Currently, Corona virus (which is a high influential biologic treat for the whole world) is the most effective item in the oil prices equation. All these 4 main categories can be directly or indirectly to be associated with the corona virus effect on oil prices.

Nearly from the beginning of the 2020, in addition to oil markets, all the global economic balances have been shaken by a biological treat: Corona Virus! The Corona virus (which has started to spread in China and brought life to a halt) has caused oil prices to drop and then to remain at low levels despite all other enhancing factors.

Although there are many other elements which has to cause the prices up (such as the builds in US stocks, oil supply problems in Libya, Nigeria and Iraq, OPEC+ not to being able to agree on high levels of production cuts), Corona Virus by overturning all the balances, made the other effects nearly negligible.

But why? And how Corona Virus has such a great effect on oil prices?

The answer includes 4 types of effects, which are real global demand drop, perceptional sight, indirect sight and a possible collapse in the supply potential.

From the sight of real demand drop, China (in the normal conditions) during pre-Corona Virus times used to have an average 13,5 million bbl / day oil consumption rates. This means nearly %13,5 of the global consumption is coming from the Chinese side. A sharp drop in China's consumption naturally cluttered the prices. In this case, at the initial days of Corona Virus, when the Chinese government proclaimed a long holiday for the whole country and declares a curfew, due to break down of industrial and transportation demand, total crude consumption fall down around %40's. This directly resulted in Brent prices to smashed to 50 \$ / bbl levels. After the extended curfew period ended, except the quarantined cities, life expected to turn into normal levels in the other lower risked regions of the country. But the situation didn't go like that. These expectations initially made the prices up, but while the virus started to spread in a faster manner, nearly the whole country had to turn their houses and try not to go out as soon as possible. All economical acts, industrial production, meetings, trade flows and strategic plans shut down. Many countries canceled and suspended the flights with China. And this made the crude prices continue to drop, instead of the expected recovery period.

In February 2020, average Chinese daily consumption was around 8 million bbl. Which means an average 5,5 million bbl / day drop in the direct global demand. Then with the beginning of April, the consumption levels of China reached again 10 million bbld levels. But this time, the virus has already spread globally. And the global demand collapsed (around %20) up to 80 million bbld levels. This is the direct demand drop effect on the crude prices.

Here we have to note that, the price reductions is continuing in spite of the Libyan supply cuts around 1,2 million bbl / day. If there were no cuts like that, then the prices would reach much lower levels and this would previously collapse (mostly American and Canadian Shale oil producers) the supply side of the equation.

From the perceptional sight, apocalyptic scenarios related to the virus and fear of spreading to other countries can be accepted as the other type of (usually dropping) effect on the oil prices.

From the indirect sight, due to economic collapse and virus risk, all international transportation and trade flows badly affected and this resulted in an indirect global consumption decrease.

Currently, we are on the stage of a global spread and we are not sure how long this period will continue and affect the further scenarios.

No one can model the biological risks and treat levels for different countries.

Of course, the prices are expected to continue to decrease due to additional demand drops and indirect or perceptional sights. But another important point is virus has started to spread in oil exporting countries also. This means the supply side of the equation will also start to decrease due to health problems.

In addition to health sight, ongoing low-level oil prices made oil companies suspend their activities, delay their meetings, cancel their investments and in the worst case (if they can not find available commercial storages) stop their productions. This means a hard break down in the supply side of the equation.

In this concept, the dropped levels of oil prices has also badly affected the smaller oil suppliers mainly in US and Canada. Nearly half of these types of companies are on the edge of bankruptcies.

This naturally means that, we can expect some incremental fluctuations to reach the natural balanced levels due to possible decreases in the supply side in the further stages! Our estimations show around a 9 million bbld of a natural possible supply cut globally up to the end of July (due to low-level oil prices and economics).

In the concept of these estimations, we initially have to check the average unit production costs of different countries.

TESPAM's estimations on the average unit production costs of 1 bbl oil in the current situations are given in the graph below:



Graph 1: Unit Production Costs for 1 bbl Oil in Different Countries

As can be understood from the graph above:

- NOTE: Transportation and tax costs are not included into the calculations.
- Many of the fields in some countries have to be stopped the production due to uncommercial conditions.
- Tight oil producers in US and Canada will be affected highly.
- The low level oil prices will directly affect the supply volumes and step by step, more companies will stop the existing producing fields due to not being profitable.
- This will affect the total supply volumes. Which means, the oil prices will increase up to a natural balance will be reached.

This means, more bankruptcies, higher unemployment rates and political risks for many countries. As a result, as can be seen in Trump's attempts, someone has to intervene the situation and US acted!

In addition to unit costs, break-even prices are also important for the oil exporting countries. Our estimates for the break-even prices (for 2020 budgets) of the due exporting countries are given in the graph below.



Graph 2: Fiscal Break-Even Prices for 2020 Budgets

As can be understood from the graph, only Qatar has the capability to handle the current lowlevel oil prices without any problems. By the way, we also have to note that, with its huge financial capacity, Saudi Arabia, Kuwait and UAE are the other important players to be able to manage the ongoing price crises. However, by reading this graph from the sight of macroeconomics, all these players (including Russia and Saudi Arabia) may be expected to find an agreement to get the prices up! This "OPEC +" conflicts will not be able to be continued for a long time.

As an additional note, we have to mention that, low-level oil prices is a big chance for the huge investors. Because, nearly all the stock market values of very popular oil companies have sharply declined. But everyone is sure that this situation will not be the same for a long time. That's why, according to their financial abilities, some funds are directly focusing on the oil assets. For example, Saudi Sovereign Wealth Fund bought some stakes around \$1 billion in Shell, Total, Eni, and Equinor (which are known as the European oil majors). This is another point to consider!

While the supply side's situation is like this, now to analyze the balances, demand side of the global crude oil equation has to be estimated.

Corona virus effect will continue nearly for the whole year. Some economic precautions are being taken by the governments. But no one is sure about the real results on the economies. Supply and demand balances will continue to be the most important issues to consider.



According to our estimations, global oil demand expectations are given in the graph below:

Graph 3: Global Oil Demand and Demand Drop Estimations

Note:

- Actual data is used up to the end of March.
- April is assumed as the worst peak time period for global corona spread.
- After the end of April, the effects of the virus is assumed to be decreasing.
- Due to collapsed economies, although there are some preventions by the governments, oil demand will not be able to reach up to 100 million bbld levels.
- In December due to weather conditions and climate effects, a very small increasing effect of corona virus may be observed again in some countries.

A huge demand drop started in China in January. Then the drop has continued with an increasing rate globally, up to the end of April. In April, average demand drop is estimated to be around 20 million bbl. Where, 8 million bbld drop is coming from US, 5 million bbld from Europe, 2 million bbld from China and 5 million bbld drop from the rest of the world.

According to our expectations, the bottom line may be in April and with the beginning of May, the virus effect may be weaken. As a result, by considering all due fluctuations, we expect an average of 92,8 million bbld of global demand in 2020.

After shortly analyzing the demand side of the equation, now we have to consider the other side, which is supply potential.

Low-level oil prices and storage constrains are the main drivers influencing the supply side of the equation.

Global crude oil storage capacity, including the offshore terminals and transportation units, is estimated to be around 7 billion bbl. More than 5 billion of this volume is mostly industrial (private) based. Around 1,6 billion is coming from governmental storage facilities and the remaining volumes are from offshore infrastructures or tankers.

Although these volumes may be seen as too big to fulfill, remaining unused storage capacity is estimated to be around %20 of the total volumes. This means, with the additional supplies and continuing less demand, the unused part will be filled and this will make some countries to directly stop production only due to storage constraints. This situation has started to be observed in Nigeria, Brazil, Angola, Norway, Colombia, Mexico, Russia, UK, US and Canada.

By adding the "low price level" effect and the commercial constrains in the equation, the total estimated supply drop is estimated to be around 7 million bbld levels up to the end of June 2020. Where nearly 1,8 million bbld supply drop is expected to be from US tight oil.

In this regard, estimated natural global oil supply (without OPEC++ agreed cuts) is estimated as shown in the graph below.



Graph 4: Global Oil Supply (without OPEC++ agreed cuts)

As can be seen from the graph,

- Due to mainly Saudi Arabia, supply potential reached to the highest levels in March.
- In April, supply will start to drop globally due commercial and stock capacity constraints and this situation will continue up to the end of July.
- In July average supply potential is expected to be around 94 million bbld. Where the total expected drop will be around (by comparing with March) 8,5 million bbld.
- With September, global supply will start to increase again.
- Annual average supply potential is 97,5 million bbld.

The global crude oil surplus will be as shown in the graph below:



Graph 5: Global Crude Oil Surplus Volumes (without agreed OPEC ++ cuts) in 2020

As can be understood from the graph, there will be a big gap between the supply and demand volumes in the first half of the 2020.



Graph 6: Global Unused Crude Oil Storage Capacity (without agreed OPEC ++ cuts) in 2020

Moreover, the above graph gives some clues about the global unused storage capacities, which has a huge effect on the supply balances. As can be understood, with the high levels of positive surplus period, nearly all the available stocks will be fulfilled globally.

In this concept, by combining all the related items, 2020 Brent price estimations are given in the graph below.



Graph 7: Brent Prices Estimation (without agreed OPEC ++ cuts) in 2020

In this scenario, our estimations show that:

- Prices will hit the average bottom level in April around 30 \$ / bbl (for Brent)
- Annual average will be around 44 \$ / bbl.
- Prices will start to increase with the beginning of May.
- Note: Other possible political or perceptional risks and effects are neglected in calculations.

In addition to these scenarios, as expected before, OPEC ++ (with the attendance of US and other oil exporters) hold a meeting on 9th of April to discuss the possible output cut. And they agreed on a joint 10 million bbld level drop in their supplies.

Off course, it is not easy to implement the decision practically. The main burden will be on states that are controlling their domestic markets through their huge national oil companies. This means, first step has to come from Saudi Arabia.

According to some statements, Saudi Arabia will cut its output around 4 million bbld. And Russia will drop the supply around 2 million bbld. Although these are not the official declarations, the proposed volumes are acceptable. In addition to these, Mexico officially rejected the agreement due to its previously taken political targets. (In the best case, it can make some cuts around 100 - 150 k bbld, instead of the OPEC quota 400 k bbld.) Every government has some commercial and political targets to follow. Moreover, financial capacities and the general stability of the countries are also important to be able to take actions. For example, no one can persuade Iraq, Iran and Venezuela for any output cuts. And due to some binding agreements, some countries may accept only a small and limited decrease in their supply volumes such as: Azerbaijan and Kazakhstan. From the sight of US, because of the market conditions, only a natural production drop (due to economic and stock capacity constraints) will differ the output (which means instead of a planned cut, there may be a projected drop).

By taken these issues into consideration, in the OPEC ++ output cut scenario, (as can be shown in the table below) we have assumed that:

- Total decrease in the crude output is due to planned cuts and natural drops in supply potentials.
- Planned cuts usually is hold by financially strong NOC's, like Saudi Aramco. These kinds of cuts are accepted as OPEC ++ agreed planned cuts.
- The second type of cut is the natural drops. Which occurs due to financial and stock capacity constraints. Like the situation in some of the fields in US, Canada, North Sea Offshore, Russia, Kazakhstan and etc.
- Total decrease in the output means the total of these two drops.
- This seems a practically possible and applicable scenario for all sides of the agreement.

	OPEC ++ planned cut	natural drop (due to commercial or stock capacity constraints)	total decrease in output
Apr	3	3,5	6,5
May	5,5	4,5	10
Jun	3	7,5	10,5
Jul	2	8,5	10,5
Aug	3,5	8	11,5
Sep	4	7,5	11,5

Table 1: Assumed Output Decrease Volumes After OPEC ++ Meeting

As can be seen from the table above, in April, Saudi Arabia will decrease its average supply around 2 million bbld. The remaining part will be held by the other OPEC + members (mostly Russia).

In April, natural drop will be around 3,5 million bbld globally. 0,5 million of this volume is estimated to be US & Canadian tight oil supplies. Another 0,5 million is to be Kazakh and Russian oil and 0,2 million will be originated from the North Sea fields. The rest is mostly from the OPEC members.

Due to continuing low-level oil prices and economical effects of Corona Virus, naturally dropped volumes are expected to increase. In May, total decrease output will be able to reach 10 million bbld levels. Then it may continue with some additional volumes. Because the natural

drops are growing. With this situation, the heavy load on the shoulders of Saudi Arabia will decrease.

In our scenario, although the current 10 million output cut decision has taken for 3 months, the period is assumed to be extended up to 6 months. We take into consideration the unused stock levels and the crude surplus volumes for this possible extension.

As a result, the revised "OPEC ++ 10 million bbld output cut scenario" was prepared as can be observed in the graphs below.

In the first graph, global oil supply with OPEC ++ agreed cuts are shown. In the next graph, revised surplus values are given. With the further graphs, the updated Brent prices, unused storage capacity volumes with the OPEC ++ cuts are mentioned.



Graph 8: Global Oil Supply (with OPEC++ agreed cuts)



Graph 9: Global Crude Oil Surplus Volumes (with agreed OPEC ++ cuts) in 2020



Graph 10: Global Unused Crude Oil Storage Capacity (with agreed OPEC ++ cuts) in 2020



Graph 11: Brent Prices Estimation (with agreed OPEC ++ cuts) in 2020



Graph 12: Brent Prices and Crude Surplus Volumes (with agreed OPEC ++ cuts) in 2020



Graph 13: Global Oil Supply Change with Agreed OPEC ++ Cuts in 2020

As can be observed from the graph above, annual average supply potential decreases from 97,5 million bbld levels to 95,8 million bbld.



Graph 14: Brent Prices Changes with Agreed OPEC ++ cuts in 2020

As can be understood from the revised graphs above, surplus rates, unused stock capacities and the crude prices will slightly change. Prices will again hit the average bottom level in April around 32 / bbl (for Brent) and annual average prices will be around 47,3 / bbl.

In addition to these assumptions, after we have completed all the due assumptions, at last OPEC declared the agreed volumes of supply drop. It will be better also to add this scenario in the paper.

In this regards, OPEC ++ attendees agreed on to cut:

- From 1 May to 1 July 2020 : 9,7 million bbld,
- From 1 July to 1 January 2021: 7,7 million bbld,
- And from 1 January 2021 to 1 May 2022: 5,8 million bbld.

As being the same in our assumptions, they already have agreed on extended "output cut period". This means,

- 1) Corona treat will continue for longer periods,
- 2) Oil industry and the global economies will be much more damaged then the expectations due to the corona spread and ongoing low level prices. And this also means, the sector will not easily be recovered.

By updating the above graphs and the assumptions with this new scenario,

	OPEC ++ planned cut	natural drop (due to commercial or stock capacity constraints)	total decrease in output
Apr	0	3.5	3.5
May	5.5	4.2	9.7
Jun	2.2	7.5	9.7
Jul	0	8.5	8.5
Aug	0	8	8
Sep	0.2	7.5	7.7
Oct	0.7	7	7.7
Nov	1.2	6.5	7.7
Dec	2.7	5	7.7

Table 2: Assumed Output Decrease Volumes After the latest OPEC ++ Meeting Declarations

As can be seen in the above table, planned cut levels and the burden on the Saudi Arabia will be lower and the natural drop will continue to effect the total supply.

Total updated global supply will be as can be seen in the graph below. And the annual average is 96,4 million bbld. Which is a little higher than our previous assumptions.



Graph 15: Global Crude Oil Supply Volume (with officially agreed OPEC ++ cuts) in 2020

And the updated Brent prices can be seen in the graph 16, where the annual average is around 46,58 / bbl.



Graph 16: Brent Prices (with officially agreed OPEC ++ cuts) in 2020

It is obvious that these price levels will continue to hit mainly the non-governmental oil and gas companies. Having high operational costs, lack of finance, storage facility constraints will worsen the situation. Although NOC's will be negatively affected by these crisis, possible governmental support may help them to handle the risky period. In this regard, undoubtedly OPEC's influence in the oil markets will increase.

After all these estimations, some of the experts may ask that if there is a possibility for oil prices to crash into 10 / bbl levels. Of course there is always such a possibility. Hence sometimes

perceptional or political factors may have higher influence on the prices than the all other factors. However, such a possibility is very weak. In addition, no one is %100 sure about when the corona virus risk will leave the earth. We can only make some estimations by taken into account some assumptions. Moreover, updated data and the alterations always have to be followed very carefully. Since all the dynamics are constantly changed, the forecasts need to be updated constantly.

It should not be forgotten that the most accurate value is the most up-to-date ones!