The impact of negative oil prices on economic growth and the consumer through the dual lens of quantitative and qualitative economic analysis

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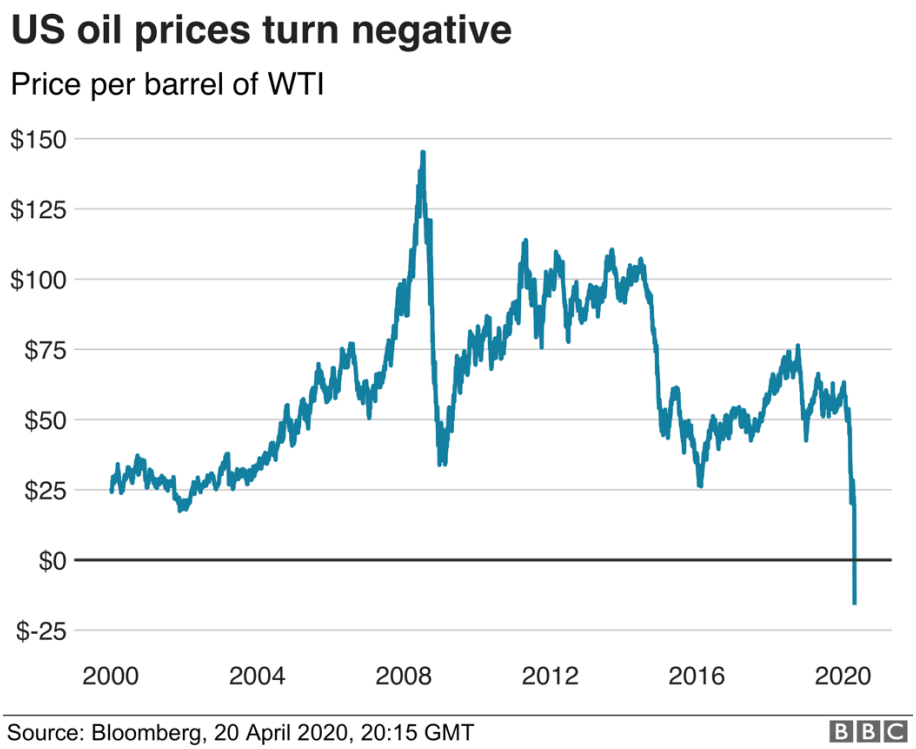
Abstract
A massive decrease in oil prices due to the COVID-19 pandemic has led to negative future contracts and with oil tankers and ships being filled up, the economy has taken a big hit due to a significant decrease in demand. Negative oil prices have both decreased economic growth and thus the Gross Domestic Product of the United States. We see that the aggregate supply has increase with the aggregate demand decreasing leading to oversupply of oil. We further evaluate that the recovery will be U-shaped due to short-term difficulties, however in the long term remain positive that the prices will stabilize.

Index Terms
Price Stability, Economic Growth, Future Contracts, Exchange Rate, Current Account Deficit

Introduction

Geology is the study of pressure and time. It's all about pressure and time. The coronavirus pandemic has created a difficult new world for investors and consumers with the oil industry with the oil industry taking a major hit due to decreasing demand and thus an increase in supply . Prices for futures contracts expiring on April 21 for the West Texas Intermediate (WTI) crude oil surprised all investors and turned negative to a negative $37.63 a barrel. This led to spot prices falling below zero, and oil producers and traders dumping a massive amount of future contracts. The benchmark for crude from the North Sea near Norway, Brent, also crashed .What's worse is that oil tanks are filling up with the decreasing demand. Onshore tanks in most parts of the U.S. are at capacity, and the rest of the world isn't far behind. What added to the misery was the fact that the May delivery contract was close to expiring so it was seeing less trading volume, which exacerbated swings, thus technical reasons were also an important factor. Changes in crude oil price are the global phenomena that felt by each country in the world. The oil price impact is in particular influential in determining the economies of emerging countries as these economies are not financially stable and are weak to the influences of external shocks. Inflation, real exchange rates are also impacted by the massive change in oil prices. Fluctuation in inflation or price levels may further lead to economic changes which could affect the economic performance of a country. Many studies report that oil price have significance impact on determining the consumer price inflation as oil is the direct input for many consumer productions and it is used as the direct input in almost every consumer product.



Oil prices turned negative as oil is mostly traded as future contracts and holders were looking for other investors to hold their contracts and were paying them to minimize losses. The price here is negative as an investor is paying another to hold a commodity which in other times would be valuable. Thus, here we see that the prices of oil turned negative. Another important factor why is the time horizon with future contracts expiring in May, with the pandemic events taking place in March and April. As a commodity, the price of oil in the market depends on supply and demand- the forces of economics, but its supply is somewhat controlled by the OPEC cartel. It's vital to gain an understanding of The Organization of Petroleum Exporting Countries. OPEC is a group consisting of 14 of the world's major oil-exporting nations. It was founded in 1960 to coordinate the oil and petroleum policies of its members and to provide member states with economic aid. OPEC is a which aims to control the supply of oil in the world and stabilize the price so as to avoid fluctuations which might affect international trade. Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela are the five founders that belong to OPEC plus the United Arab Emirates, Libya, Algeria, Nigeria, and five other countries.

We list down some factors which impact investing with oil and how prices went negative –

Demand - OPEC estimates that he the current world demand for oil at between about 98 million barrels in 2018. Through historical data, we have seen that when the price of oil rises, this decreases demand in the United States, which breaks the laws of economics which state that as there is an increase of demand, price will go up. But here we say that demand has increased for the world, however the price has inly gone up or the OPEC countries as major producers which adds to their economy. Currently, there is no demand for oil as the world is in lockdown hence there is no travel unless it is essential with airlines or cars, which means almost no demand.

Supply - On the supply side, in 2018, approximately 93.6 million barrels of oil were produced. The amount of reserves found has fallen every year since 2014 as budgets for oil exploration has been cut following the fall of oil prices, however now we see an increase in reserves as there is simply no demand and thus a glut in supply. The United States, Russia, and Saudi Arabia are the world's leading producers of oil. Recently, oil prices collapsed amid the COVID-19 economic slowdown. OPEC and its allies agreed to historic production cuts to stabilize prices, which dropped to historic 20 year lows.

Location – High-quality sweet crude is one of the major problems faced by oil producers which helps in the stringent environmental requirements, particularly in the United States. This is why, despite the rising production of oil in the United States, it must still import oil. However, currently with a stop in production it will be a problem for the United states as they will see an increase in volume of their supply, but no of sweet crude. Meanwhile, it imports other types of oil to maximize its production based on refining capacity. There are also differences in terms of where oil is produced for sale. For example, the major difference between Brent Crude and West Texas Intermediate is that Brent Crude originates from oil fields in the North Sea between the Shetland Islands and Norway, while West Texas Intermediate is sourced from U.S. oil fields, primarily in Texas and Louisiana. Both Brent Crude and West Texas Intermediate are light and sweet, thus ideal or refining into gasoline

Research and Methodology

To augment my knowledge on investing and oil with futures contracts and how it relates to the consumer and economic growth, we went through scholarly articles and academic journals through the national bureau of economic research with papers talking about the interaction between oil prices and economic growth. I created my thesis on negative oil prices and economic growth through formulating ideas with secondary sources such as blog articles from CNBC titled "Why oil prices went negative and why they might never go negative again". For economic graphs including the decrease of economic growth, I utilized Paul Krugman's macro-economic textbook, while also referred to the micro-economic textbook or reference and knowledge. The research aims to give a basic understanding of investing in oil and the factors behind and how the current coronavirus pandemic caused negative oil prices with oil future contracts. We begin our research by educating our readers about the definition and impact of negative oil prices with moving on to the impact to the consumer. Then, we delve on to the impact of economic factors both quantitatively and qualitatively on both the microeconomic and macroeconomic level with the overarching pressure of OPEC. We end with discussing the recovery phase and thus whether we predict a U-shaped or a V-shaped recovery.

Studies and Findings –

The price for a barrel of oil to be delivered in the month of May fell to -$37.63 in the end of April with oil tankers filling up and simply no demand. Sellers would have to pay someone to take off the oil future contracts off their hands. This historic plunge is a prime example of how the oil markets work. The May contracts went negative due to the time horizon, however both June and July contracts are still positive which complements stability in the long run. However, demand for oil has collapsed in recent weeks as the coronavirus pandemic has caused economic turmoil, eliminating much of the need for fuel to ship goods. Without a use for oil, large oil producers are running out of places to store all the oil. Thus, traders this week were willing to pay to get rid of oil rather than figure out how to keep storing it.

Effects of the negative oil prices to the consumer -

Price at gas pump – We as consumers should initially be content, as the decrease in oil prices means that we have to pay less at the gas pump. However, with no travel, it makes no sense to take advantage of this opportunity. The average price in the U.S. for a gallon of regular gasoline fell to about $1.49 or less, more than $1 less than a year ago. But this time around, it's not good for anybody as typically when oil prices fall, gasoline prices fall and that benefits consumers but prices fell right now because hardly anyone is driving. So there's no winner in this situation today.

Stock Market - The crash in oil prices is weighing on the stock market too, with Dow Jones Industrial Average futures pointing to a decline of more than 2%. The plunge in the oil market is has impacted oil companies such as Exxon and Automobile companies such as Chevron which point for decreased sales and hence bad earnings.. Pessimists have called the rally overdone, pointing to the severe economic pain sweeping the world and continued uncertainty about how long it will last. The Nasdaq was down 3% due to the oil crises and the Dow stumbled to under 24,000 points with big stocks such as Boeing crashing which hurts the average consumer with Boeing and the dow index funds being a major component of IRA's and pension funds.

Oil Storage - With far less gasoline and jet fuel being consumed, oil tanks are starting to fill up understandably. Experts have been warning that global storage could fill up by June 2020 with the current demand and supply. Some producers have decided to move oil now, because the space may become more valuable than the oil. Eventually, the problem currently with oil producers is that they will go to a point where literally there's so much of a valuable commodity in the world that the commodity no longer has value, which in this case is oil.

Economic Analysis on the change of oil prices -

Oil has always been an indicator for economic stability due to the World's high dependence on oil products with demand ever so increasing . Furthermore, the price of oil is vital to today's world economy, as oil is an internationally traded good which has helped build international trade and relations which impacts the exchange rate and the overarching world economy. Moreover, the prices of energy intensive goods and services including oil makes up the single most important share. Oil price increases are generally thought to increase inflation and reduce economic growth. In terms of inflation, oil prices directly affect the prices of goods made with petroleum products. Increases in oil prices can depress the supply of other goods because they increase the costs of producing them, not acting as complements, as with airplanes. The increase in the price of oil will decrease the number of airplanes made as it would lead to increasing costs. Some economic factors which have been impacted due to the change of oil prices -

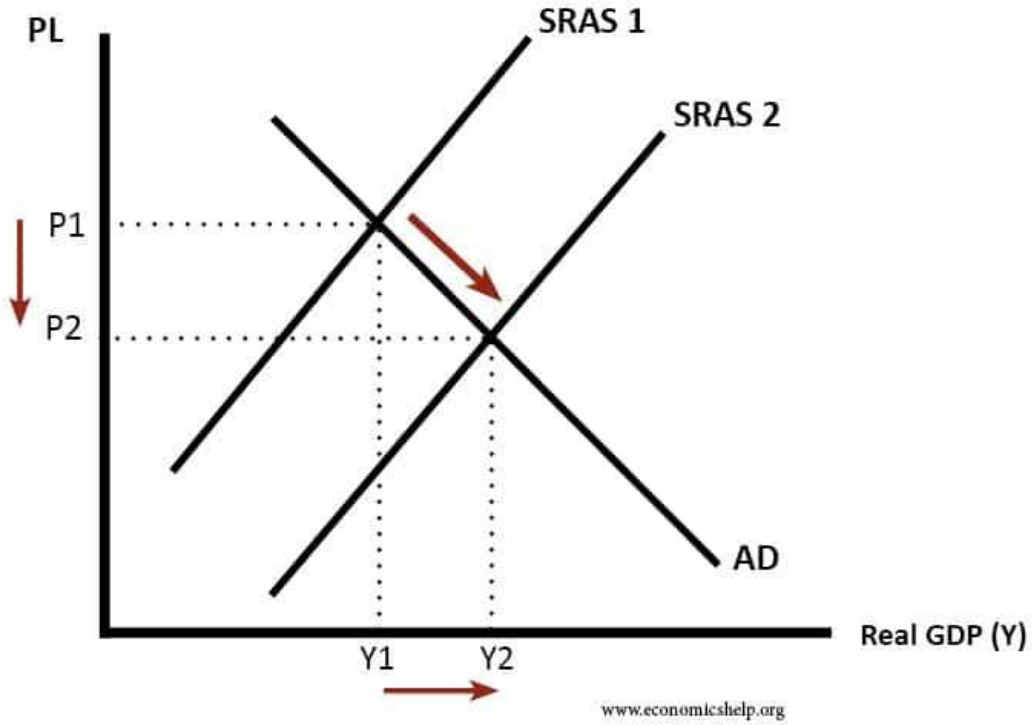
Negative Economic Growth – The decrease in oil prices has led to negative economic growth in the world due to the loss of jobs due to the oil crises which directly impacts economic growth as there will be no increase in the gross domestic product if

there is no consumption and there will be no consumption if there is unemployment. As World economic growth increases the demand for oil increases which pushes up oil prices. Oil prices then, tend to be volatile due to variations in the business cycle. The perception that oil price spikes have a serious negative effect on the economies is based largely on the close correlation in the timing of oil price spikes and economic downturns. All things being equal, an oil price decrease should be considered, negative in oil exporting countries and positive in oil importing countries. However, in the case right now, it is negative for both exporting and importing countries with simply no demand. An oil price increase leads to a transfer of income from importing to exporting countries through a shift in the terms of trade, however with all means of travel stopped there is no trade between countries at the moment which would deteriorate economies in the short run.

We have seen that demand for oil is entirely dependent on economic growth. As the U.S., China and well over 150 other countries have gone about closing down a huge percentage of their economies to try to combat the virus. Economists are estimating that economic growth in the U.S. for April and May could be negative 25-30%, The result of this negative economic growth has very predictably been a collapse of demand for crude oil. The consequence of that particular wreck is that millions of barrels have no place to go as discussed in the 'Location' factor discussed above and are thus flowing into storage facilities in the U.S. and across the globe.

Effects on a micro-level – As a consumer, you may already understand the microeconomic implications of lower oil prices as discussed above. When observing negative oil prices in future contracts, most of us are likely to think about the price of gasoline to go down as well, since gasoline purchases are necessary for most households. When gasoline prices lower with no demand, a larger share of households' budgets is likely to be cash, which leaves more to spend on other goods and services. Higher oil prices tend to make production more expensive for businesses, just as they make it more expensive for households to do the things they normally do.

Effects on a macro-level - Oil price decreases are generally thought to decrease inflation and reduce economic growth as discussed above in the "Economic growth" section. Oil prices directly affect the prices of goods made with petroleum products. We also know that oil prices indirectly affect costs such as transportation, manufacturing, and heating. The extent to which oil price decreases lead to consumption price decreases depends on how important oil is for the production of a given type of good or service. However, in the situation with the coronavirus, even on a macro-level we see there is no rise in aggregate demand with aggregate supply increasing with the oil tankers being filled.



This diagram above shows that a fall in oil prices will shift the short-run aggregate supply to the right, causing lower inflation with the indication of the decrease of the price level from P1 to P2 and higher real GDP from Y1 to Y2. Currently, we are seeing a decrease in the price level and also a decrease in the real GDP as factors such as consumption and investments topple government spending. Oil price decreases can also stifle the growth of the economy through their effect on the supply and demand for goods other than oil. Decreases in oil prices can increase the supply of other goods because they decrease the costs of producing them. Through economics analysis and graphing, low oil prices can shift down the supply curve for the goods and services for which oil is an input.

Balance of Payments and the Exchange Rate - Oil importers will gain from a reduced oil price because the value of their oil imports will decrease, leading to higher profitability. This reduces the current account deficit of oil importers; which for a country such as India which imports 70% of oil consumption and thus has a large current account deficit. Currencies would adjust to changes in trade balances too due to the decrease of prices in oil. Since oil contracts are settled in US dollar and oil exporters invest part of their earnings in US dollar assets, lower oil prices would lead to decrease the value of US dollar by lowering the transactions demand for it. In normal terms, a stronger dollar would raise the cost of servicing the external debt of oil-importing developing countries, however in a situation like the Coronavirus playing the role of an external economic factor, we see that the US is a loser here as there is no means of demand.

Impact on Oil Exporters - For oil exporters, a fall in oil price is damaging to their respective economy. Tax revenue from oil production is of vital importance to oil producing nations in attempts to fund government spending. Russia is a prime example. It gains 70% of all tax revenues from oil. A decrease of oil prices will lead to a government budget deficit, and will require either higher taxes or government spending cuts which the government would have to adjust. Other oil exporters like Venezuela have relied in the past on oil revenues to fund generous social spending. A fall in oil prices could lead to a significant budget deficit and social problems.

Other Economic Impacts – The oil crises increases the profitability for alternative energy sources with tesla – the non-oil car company- and its stock price for April 2020 being a great example. The stock price increases by a staggering 20% due to competition getting battered with the oil prices. In recent years, there has been an incentive to invest in renewable energy and electric cars such as Tesla with the explanation above. Falling oil prices could delay investment into alternative 'greener' forms of energy, such as electric cars, and this could have negative consequences with none seen right now. However, in the long-term falling oil prices could reverse the recent decline in-car use, leading to a steady increase in traffic congestion and thus the environmental costs of petrol use which is another factor we have to consider.

The impact of OPEC and the problem of storage-

On May 1st, 2020, both the OPEC and the group of 20 decided to cut down on the oil production. But there's the oil tankers have already been filled to the brim with an additional supply of 40+ million more barrels of oil no one needs. We understand through secondary research that much of that will go to the Saudi Aramco-owned Motiva refinery in Texas. We can say that if refineries ultimately don't want oil, it has little to no value. Having a commodity but no place to store it would lead to a decrease in the value. The key question right now is how much time is left until every oil tank and ship is full?

Recovery Prediction: U-Shaped or V-Shaped?

The oil crises isn't one which would be solved in the short term, however in the long run with economic factors getting back to normal with government measure, will result in a U-shaped recovery. However, many analysts have also predicted that a recovery in stocks is due to the expectation among some investors that the economy will rebound sharply once economic quarantines are lifted, hence a V shaped recovery. They're essentially predicting that a line chart of the economy will resemble the letter "V," with a wild ride down but then a quick pivot to a vigorous recovery. However, I predict that is only the case in the stock market due to the sheer volume and speed of trading with the added factors of how manipulative the prices are. In the world economy, a V-shaped recovery is too optimistic to say the least and that a U-shaped one is a more cautious approach. We thus predict a U-shaped recovery where the economy bottoms out and stays at that low level for a while before recovering with strategists at Barclays in align with our prediction. It is safe to say that without strong testing programs for the virus, businesses likely won't feel comfortable bringing back their full workforces which adds to the U-shaped recovery for the oil prices.

Conclusion

Thus, delving deeper into the economic factors in both the macro and micro level we have seen that negative oil prices affect consumers from paying at the petrol pump to investing in the stock market. We have successfully evaluated the how economic growth and exchange rates have been impacted through the prices of oil going negative. The OPEC deal agreeing to cut the volume of prediction of oil has certainly bettered the economy with improving stock prices and storage availability. Moreover, June future contracts on oil and especially the WTI should recover. In the short term however, consumers will be impacted negatively due to the opportunity cost of prioritizing to stabilize oil which will also impact balance of payments and thus the consumer with a possible trade-off. However, in the long run prices will stabilize and the economy should recover with both supply and demand playing their respective roles. There were some limitations in the research including the lack of primary research including interviews with oil investors and their opinion.

Future research will include whether oil prices will ever go negative again.

This had never happened before, and experts do not expect prices to stay negative for days or weeks. Demand for oil is likely to remain tepid for months because few experts believe the economy will quickly rebound to where it was before the pandemic.
But the low prices will also put pressure on oil companies and countries like Saudi Arabia and Russia, huge producers, to pump less oil because they themselves will run out of room to store it. That should, over time, help lift prices — or at least slow down declines. Thus, we have reached a final conclusion that negative oil prices has decreased economic growth in the short term, but will stabilize in the long run.

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