

Factors and Trends Analysis of International Crude Oil Price in 2022

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ABSTRACT

Due to the reopening and remarkable recovery of the global economy from the epidemic, as well as the increased mobility of people under higher vaccination rates, 2021 has been a year of significant recovery for both supply and demand of crude oil. Since the shortage of natural gas has fuelled a widespread demand for crude oil as a substitute, the year 2022 may hold a lot of potential and meanwhile uncertainty for crude oil investors. This study focuses on both qualitative and quantitative analyses to review and summarize the past year's trend of international crude oil market prices, analyze the price influencing factors, as well as judging and forecasting the trend for the coming year. The qualitative analysis is mainly from the fundamental and non-fundamental point of view. In the quantitative analysis, the study mainly uses the ARDL-ECM model to do a regression analysis of the main influencing factors of the international crude oil market price. In addition, the paper uses a GVAR model to study the impact of global variables on individual country variables, i.e., a long-term scenario of relatively moderate oil prices, moderate increases in geopolitical risk, and relatively stable or decelerating financial liquidity growth. The study concludes that non-fundamental factors are negative for crude oil prices in 2022, but that the overall level of oil prices is relatively unchanged from last year.

Keywords: *International Crude Oil Prices, Factor Analysis, Price Trends, ARDL, ECM.*

1. INTRODUCTION

With the recent wave of oil price increases, international oil prices have risen to a peak point of the year. Although the forecast conclusions of various parties vary widely, the fundamentals analyzed are nothing but the impact of the epidemic, oil supply and demand, and geopolitics. Among them, the assessment of the impact of Covid-19 is the main reason for the difference in the forecast results of different parties.

By using both qualitative and quantitative analyses, this study conducts a review summary of the past year's trend of international crude oil market prices and an analysis of price influencing factors, as well as the trend judgments and forecasts for the coming year. The qualitative analysis is divided into the fundamental and non-fundamental aspects of international oil prices, while the quantitative analysis is mainly given to the OLS regression model after the ARDL-ECM model test and the GVAR model. The ARDL-ECM model detects the presence of structural mutations and their impact on global crude oil prices and price dependence. The GVAR-based model studies the impact of global

variables on individual country variables, i.e., a long-term scenario with relatively moderate oil prices, a moderate increase in geopolitical risk, and relatively stable or decelerating financial liquidity growth.

The research can fill the precision of price analyses and forecasts in the international crude oil market, broaden the range of factors' dynamic influence, and strengthen the mastery of the elasticity and uncertainty of price changes.

2. REVIEW OF 2021

International oil prices of 2021 generally rise and fluctuate greatly. The average annual price of Brent crude oil is \$70.86 per barrel, and the average annual price of West Texas Intermediate (WTI) crude oil is \$68.13 per barrel, up 68.88% and 73.98% [1] respectively from 2020. Overall, the global economy quickly recovers from the shock. The outbreak of the COVID epidemic in 2021 will drive a substantial increase in crude oil consumption, according to the trend of international oil prices in 2021 shown in Figure 1.

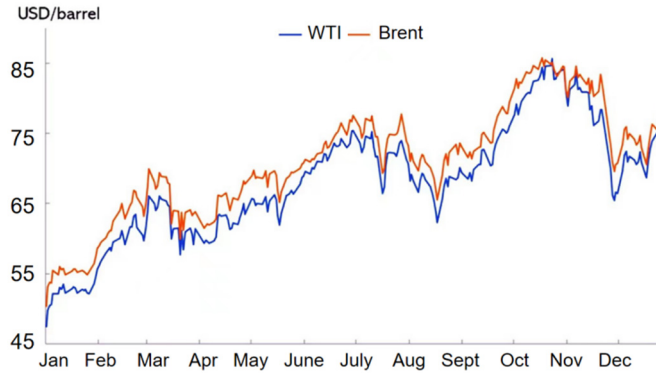


Figure 1 Trend of international oil prices in 2021 [2].

Crude oil market fundamentals continued to be strengthened in January and February as energy demand recovered and OPEC+ producers decided to limit production slightly. Supply and demand remained tight and oil prices climbed. Frequent virus outbreaks and a slowdown in vaccination programs have lowered expectations for a European economic recovery in March [3]. Oil prices have been under pressure. From April to June, due to various factors such as the improvement of the economic situation and the rebound in energy demand, the implementation of a small production increase plan by OPEC+, and the obstruction of negotiations between the United States and Iran, international oil prices fluctuated and rose [4]. Oil prices varied widely from July to August, and since then OPEC+ agreed to a small increase in production, alleviating fears of a sharp

increase in supply. The prospect of constrained crude supplies supported prices in September and October. The United States and major energy consumers released strategic petroleum reserves in November and December to lower oil prices and ease energy supply problems [5].

3. ANALYSIS OF THE OIL MARKET SITUATION IN 2022

3.1 Fundamental analysis of oil market

3.1.1. The global economy continues to recover in an orderly manner, but there are still great uncertainties

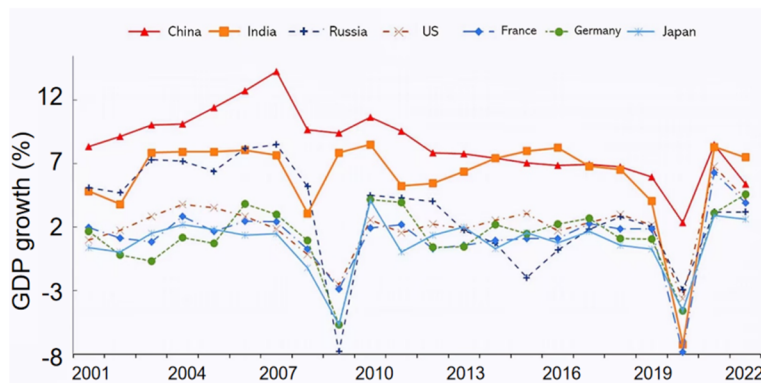


Figure 2 Economic Development Trend of Major Countries [8].

The world economy had an extremely significant comeback in 2021. The rate of economic recovery differs significantly among countries. China will continue to be the world's top economic provider. By 2022, all countries' economies will be on track to recover in a timely way, providing a strong foundation for the recovery of crude oil demand. However, the supply chain is still in jeopardy as a result of the outbreak, and greater inflation expectations will wreak havoc on the economy's development prospects. Crude oil consumption will be influenced by certainty to some extent. Global GDP is expected to rise by 4.9 percent in 2022 [6], according to

the IMF's World Economic Outlook, with developed economies growing by 4.5 percent and emerging market and developing economies growing by 5.1 percent [7]. Figure 2 depicts the economic development pattern of major countries.

In general, it is projected that by 2022, the world economy will have recovered from the epidemic and will be returning to regular development. Different countries' economic prospects will be more differentiated; output will recover, but demand will stagnate, and economic growth will return to normal. The global economic

recovery will be led by developed economies, and crude oil consumption will continue to rise. Repeated epidemics, on the other hand, will generate supply chain disruptions, production interruptions, and periodic demand reductions.

3.1.2. The major oil-producing countries have obvious willingness to increase production, and the market welcomes loose supply

The OPEC+ production standard was changed, and crude oil supplies steadily increased. OPEC+ effectively shifted the crude oil market from a severe glut to a

shortfall in 2021 [9], achieving a basic balance in the crude oil market. The United Arab Emirates proposed raising the output threshold in July 2021, causing disagreement among OPEC+ members until an agreement was achieved. The entire baseline increase in OPEC+ oil output will be 1.63 million barrels per day [10] starting in May 2022. This disagreement also demonstrates OPEC+'s internal inconsistencies and desire to fight for market share. It is worth noting that the Russian oil sector has weathered the epidemic crisis' peak production reduction time and has received significant investment to resume production and development, which is predicted to approach pre-epidemic levels in 2022.

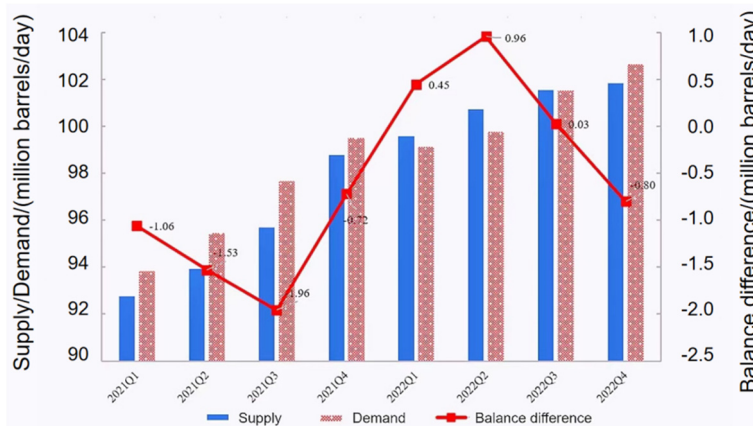


Figure 3 Global Crude Oil Supply and Demand Situation Chart [11].

The output of crude oil in the United States has gradually rebounded, and future growth rates may exceed predictions. The Baker Hughes rig count in the United States continued to climb slowly and gradually in 2021, despite obstacles such as the shale oil industry's shift in capital expenditure discipline and the transition of traditional US energy regulations. The number of crude oil rigs is likely to swiftly expand as workers in key oil-producing states gradually return to work at the end of the year, and future output may exceed forecasts. According to the EIA, crude oil production in the United States will climb to an average of 11.8 million barrels per day [12] in 2022.

In 2022, the supply-side picture is quite obvious with OPEC+ continuously raising output and non-OPEC+ countries led by the US boosting production. However, due to the epidemic's disruption and demand projections, crude oil supply remains unpredictable.

3.1.3. Commercial crude oil inventories rebounded from a low level, which played a positive role in stabilizing oil prices

According to the United States Department of State and the EIA data, in the first quarter of 2021, US commercial crude oil stocks decreased and then grew, peaking and then dropping after reaching a high of 501

million barrels [13] in March. The world economy continued to recover in the second and third quarters, thanks to the vaccination and the removal of the blockade, and crude oil consumption increased significantly. Shale oil production in the United States has slowed as a result of the suspension of oil and gas drilling rights and storms, and crude oil inventories have continued to fall, almost returning to pre-epidemic levels. For the year, September saw a low of 418 million barrels, well below the 2016-2020 average. OECD crude oil inventories are also low, with 149 million barrels less than the average from 2015 to 2019. With the resurgence of the pandemic, crude oil production grew faster than global demand in the fourth quarter, the destocking rate slowed, and stockpiles rebounded marginally. Looking ahead to 2022, the shale oil output in the United States is predicted to increase as the number of onshore rigs grows [14]. Crude stocks will rise again as production and demand growth stagnate, preventing oil prices from rising too quickly.

3.2 Non-fundamental analysis of oil market

3.2.1. The dollar remains relatively strong, and oil prices are under downward pressure

The US dollar index gained in the first half of 2021 due to the increasing US bond yields [15], but subsequently decreased due to a surge in US fiscal

spending. The US dollar index swung significantly in the second half of 2021, as the Federal Reserve issued periodic signs of monetary policy tightening. The US dollar index soared past the 96 mark [16] in November, achieving a new high for the year, thanks to the simultaneous push of Taper (asset purchase reduction) being officially initiated and inflation exceeding expectations. The Fed declared at its December FOMC meeting that it will accelerate Tapering and halt bond purchases in March 2022. The Fed's monetary strategy has become obvious, and it is predicted that after the completion of Taper, the Fed would raise interest rates [17]. In general, the US currency will remain strong, and worldwide oil prices will continue to decline.

3.2.2. The net long position of futures is deeply adjusted, and the market is in a bearish situation

The net long position in crude oil futures fluctuated a lot in the first half of 2021, reaching a high of 526,000 contracts in June [18]. With the rapid spread of the delta-mutant strain, market sentiment deteriorated, and speculators' expectations of diminished global oil demand grew. Crude oil futures sold down quickly in July and August, and non-commercial net longs in WTI futures plummeted to their lowest level since November 2020. Since September, speculators have been positive on oil prices due to a jump in energy prices in Europe and Asia, including natural gas, coal, and electricity. The futures market is likely to be negative in 2022 due to the gradual increase in supply in the crude oil market and the delay in demand recovery following the economic recovery.

3.2.3. The ratio of gold to oil has gradually declined, indicating that the global economy is recovering for the better

The gold-oil ratio falls to an average low of roughly 20 in 2021, from a high of 189 in 2020. This indicates that the global economy will continue to recover and develop. Gold can indicate market risk appetite as an anti-inflation and safe-haven asset. According to the data issued by the World Gold Council, the global demand for gold declined by 9% in the first three quarters of 2021 [19] compared to the same period last year, reflecting optimistic expectations for the global economy's sustained growth and that the market's risk aversion has been lessened.

3.2.4. The game of great powers intensifies, and uncertainty on the supply side increases

The war between Russia and Ukraine continued, and the chaos exacerbated the market risk. If Russia continues to invade Ukraine, the United States and the European Union will escalate sanctions. In addition, the situation in the Middle East remains tense and the supply is

vulnerable. Although in 2021, with the adjustment of the US government's policy on the Middle East, the benign interaction among major countries in the region increased and the hot spots generally cooled down. However, affected by the unstable situation, the crude oil supply in the Middle East will be relatively unstable.

4. FACTOR ANALYSIS OF INTERNATIONAL OIL PRICES

This part introduces the structural mutation into the traditional time series model, and detects the existence of structural mutation and its impact on global crude oil price and price dependence based on ARDL-ECM model. The study found that geopolitical events and financial crisis are the main factors leading to the structural changes in the global crude oil price relationship, but the effects of different events are different. The generalized impulse response function of GVAR model confirms the assumption that the negative impact on oil prices will lead to higher geopolitical risks and lower global financial liquidity with the deceleration or reversal of the petrodollar cycle. Impulse response analysis also shows that the positive impact on geopolitical risks may lead to the rise of oil prices. Therefore, the cycle of low oil prices will lead to geopolitical conflicts, which will lead to the rise of oil prices. GVAR model can study the impact of global variables on individual national variables [12]. In this regard, there is a need to pay attention to the most likely scenario of global dynamics, that is, the long-term scenario of relatively mild oil price, moderate rise of geopolitical risks, and relatively stable or decelerating growth of financial liquidity. Under such circumstances, countries that are heavily dependent on oil exports such as Saudi Arabia are unlikely to succeed in achieving significant economic growth in other sectors to compensate for the inevitable recession.

5. CONCLUSION

Looking ahead to 2022, OPEC+ will maintain a stable production line. The U.S. leads non-OPEC+ as the main driver of oil production growth, with strong crude oil supply growth. Overall, the supply-demand balance in the world crude oil market is expected to shift from a shortage to an easing in 2022, thereby dampening oil price increases.

Non-fundamental factors are unfavorable for crude oil prices in 2022. The US dollar remained relatively strong, the futures market was bearish, and the gold price rebounded to release a bearish signal, with limited kinetic energy. Negotiations between the United States and Iran have reached a stalemate, and the Russian-Ukrainian war continues to intensify geopolitical risks in the crude oil market, affecting crude oil supply expectations. In 2022, affected by non-fundamental factors, the downside risk and volatility of oil prices will increase. Combined with

the objective calculation and subjective judgment of the forecast model, it is expected that the average international crude oil price in 2022 will be basically the same as that in 2021. If it were the same, the spread between Brent and WTI crude would swell. Brent and WTI crude prices are expected to average between \$65-75 per barrel to \$62-72 per barrel. Finally, this study may not be rigorous and may be biased in some of the analyses because of the incomplete coverage of the influencing factors, and it is worth trying to use more model testing tools for validating the influencing factors in the future.

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