U N I V E R S I D A D A U T Ó N O M A D E M A D R I D

La SEI
School of Economic Intelligence
Escuela de Inteligencia Económica
Universidad Autónoma de Madrid

2020

Volumen 3
ISSN 2660-7352
Editados por la Escuela de Inteligencia Económica y RRII
Editor Jefe / *Chief Editor*: Ángel Rodríguez García-Brazales

REPORTS DE INTELIGENCIA ECONÓMICA Y RELACIONES INTERNACIONALES

The case of the negative oil price: When technology and economy change oil geopolitics

Ángel Rodríguez García-Brazales

On April 20th the oil was traded at negative price of $-37.6 for the first time in its history. Beyond the collapse in the demand due to the lockdowns, there were other factors involved. First, the shale revolution, that had led the US to a leading role among global oil producers. Second, the price war between Russia and Saudi Arabia in March and April 2020, that added 2.7 million barrels per day (bpd) in the market, while the global demand was shrinking by 10 million bpd. The price war could be motivated by the stagnation of Russia and Saudi Arabia market shares due to the growth of the US oil exports and the apparent geopolitical weakness of the US in the Middle East in Q1 2020.

Universidad Autónoma de Madrid UAM

La_SEI
School of Economic Intelligence
Escuela de Inteligencia Económica
Universidad Autónoma de Madrid

Título: *The case of the negative oil price: When technology and economy change oil geopolitics*

Autores: Ángel Rodríguez García-Brazales[1]

ISSN 2660-7352

Reports de Inteligencia Económica y Relaciones Internacionales

Editor Jefe: Ángel Rodríguez García-Brazales

Editada por la:

Escuela de Inteligencia Económica
Universidad Autónoma de Madrid
Campus de Cantoblanco
C/. Francisco Tomás y Valiente, nº 11, Edificio C, planta 3ª
28049 MADRID (SPAIN)

[1] The autor appreciates very helpful comments from Manuel de Juan Espinosa, Cristina Gómez Simón, Juan Carlos Pérez Lozano, Jorge Turmo Arnal and Óscar Vara Crespo. Remaining errors and mistakes are my own responsibility.

Contents

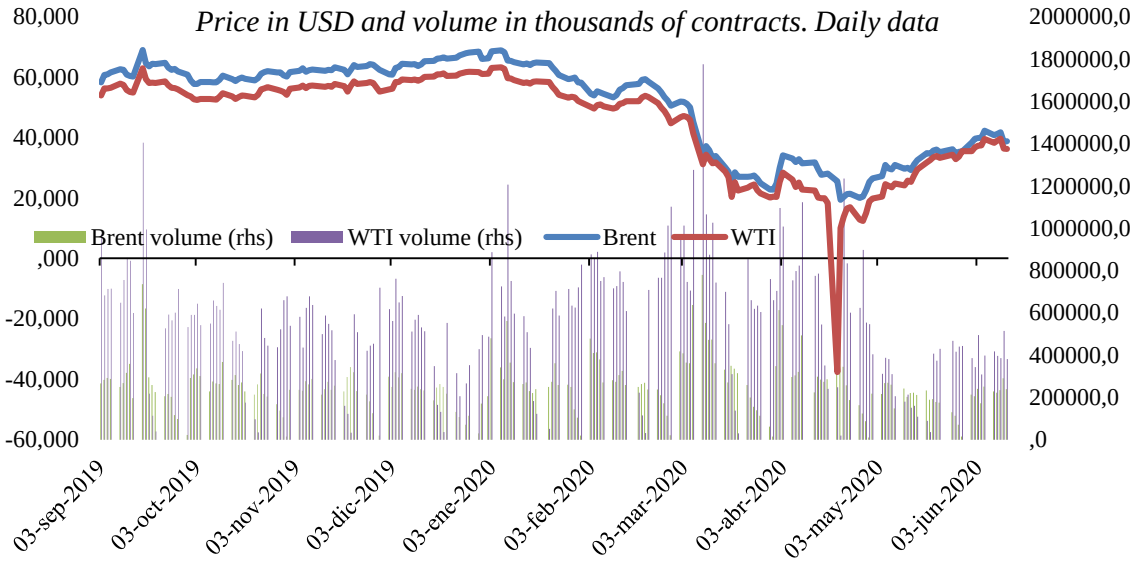
***Abstract**: On April 20th the oil was traded at negative price of $-37.6 for the first time in its history. Beyond the collapse in the demand due to the lockdowns, there were other factors involved. First, the shale revolution, that had led the US to a leading role among global oil producers. Second, the price war between Russia and Saudi Arabia in March and April 2020, that added 2.7 million barrels per day (bpd) in the market, while the global demand was shrinking by 10 million bpd. The price war could be motivated by the stagnation of Russia and Saudi Arabia market shares due to the growth of the US oil exports and the apparent geopolitical weakness of the US in the Middle East in Q1 2020*

1. Introduction

On April 20th a punctual accumulation of stockpiles in Cushing, Oklahoma, led oil price to $-37.6. The immediate cause was the lack of storage capacity as the coronavirus lockdowns collapsed gas demand. Cushing is the biggest oil hub in the US, with 10% of the total US inventory capacity and where the benchmark price of the oil market, the WTI (West Texas Intermediate), is referenced. Oman and Brent benchmarks did not go into negative territory (see chart 1) and kept slightly above $23 and $25 respectively, suggesting that the cause was limited to the US oil market. On April 21th, the West Texas (WTI) returned to positive and was traded above 10$ in what can be considered as one of the biggest rallies in oil market history. A Goldman Sachs analyst summarized the cause pretty well: "Indeed, given the cost of shutting down a well, a producer would be willing to pay someone to dispose of a barrel, implying negative pricing in landlocked areas."

Chart 1. Oil market.

Price in USD and volume in thousands of contracts. Daily data



But the ultimate cause was the price war between Russia and Saudi Arabia that started "officially" on the 6th of March, when Russia rejected to cut production in an OPEC+ meeting[2]. In fact, the oil market was in a bearish trend since early January 2020. From the peak of $68.91 the 6th January to the trough of $-37.6 the 2th of April, the WTI has plummeted by more than $106. On June 19th, the WTI stood at $40, posting a drop of $29 since January. These levels are not casual, as they result from price

[2] OPEC's 14 member countries control about 35% of global oil output and 82% of proven reserves. OPEC+ is an extension of the OPEC, including 10 Non-OPEC oil producers as Russia, Mexico and Kazakhstan. OPEC+ controls about 55% of output and 90% of proven reserves.

thresholds imposed by economic and technical restrictions to the world's biggest producers. Considering that the oil price has remained more or less stable over the last two years in the range of $60-70, the impact on oil revenues will be sizeable in the two major contenders, Russia and Saudi Arabia (SA). The price war ended the 12th of April after an agreement between Russia and OPEC to cut production by 10 million bpd, brokered by the US. However, the WTI kept falling as very low demand and lack of stockpile room led oil operators to pay to get rid of contracts to deliver in May.

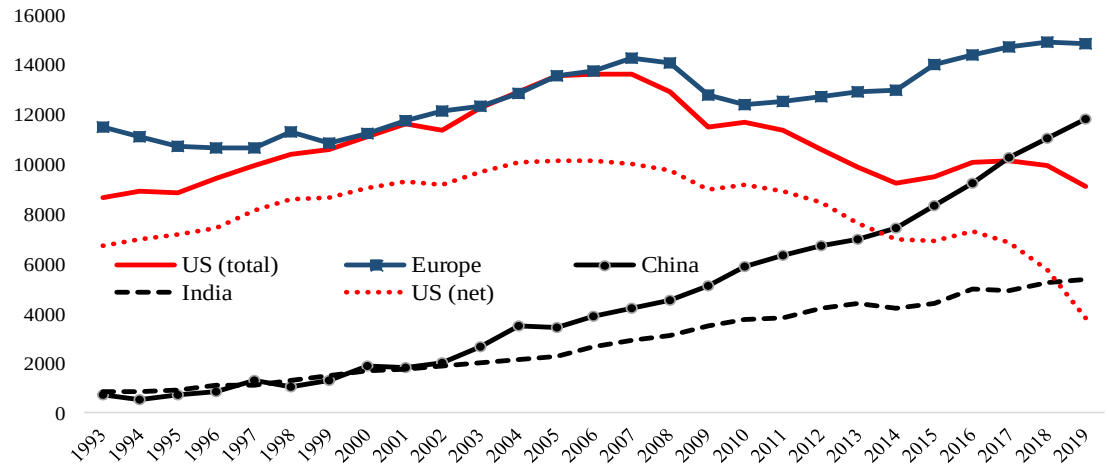
The price war has been just an episode in the long-standing competition for gaining a larger market share in the global oil markets. The shale revolution has led the US to a leading role as global oil supplier, threatening the prior status quo and adding market pressure to the traditional producers, Russia and SA. Contrary to the US, those economies are heavily dependent on oil exports for their GDP growth and their fiscal revenues. So, facing a sudden and unexpected collapse in the global oil demand, a price war was not an unlikely outcome. Recent geopolitical tensions could also have a role in the Saudis' reaction, as the US traction in the Middle East seems to be weakening. This report summarizes those factors, starting with the impact of the shale revolution, going through the hallmarks of the price war and ending with Russia and SA motivations to engage in a self-destructive war.

2. The shale revolution: the US enters into the global oil market

In less than a decade, the shale revolution has converted the US in one of the three biggest oil producer and exporter in the world. Fracking and shale technologies have made the US not only self-sufficient, but becoming one of the three largest oil exporters in the world after decades, being the largest oil net importer. The US net imports of crude[3] oil has fallen by 75% (see chart 2) over a very short period of time (about ten years). This change has had deep implications not only for the oil market, but also for oil geopolitics in the Middle East and Eurasia.

Chart 2. Imports of crude oil

Annual data, thousands of barrels per day



Source: British Petroleum database and EIA for US net imports.

The performance of the shale industry is usually assessed through the number of working oil rigs, although there seems to be a disconnect between rig count and production in recent years.

[3] On December 18, 2015 the US Congress lifted a 41 years old ban to export oil. However, the net imports started to fall 5 years earlier, when the US oil industry began to meet domestic demand.

This indicator has shown a strong positive correlation with the WTI in the past, suggesting that high prices increase the number of wells in operation and vice versa (chart 3). The current fall in the WTI has also induced a reduction in the number of rigs, going from 790 on the 28th of February to 279 on the 12th of June[4].

However, some analysts have suggested that production has not reacted that much to the fluctuations in the oil price over the recent years. With less than a half of operating oil rigs than in 2014, the US is still pumping at record high levels of barrels per day (bdp). This suggests that the industry has reacted to the price drop in 2014 by implementing new and more efficient extraction technology.

Chart 3. Oil production and number of oil rigs in the US

Monthly data. Production in thousands of barrels per day;

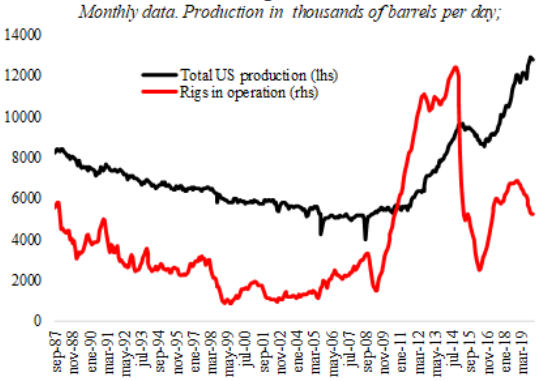
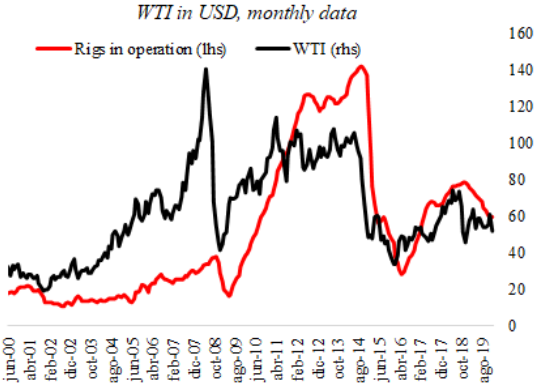


Chart 4. WTI and number of oil rigs in the US

WTI in USD, monthly data



Source. EIA database and Thomson Reuters Eikon.

New empirical evidence suggests that the US shale sector could be more resilient than initially expected. The debate around the oil price needed to make a shale oil well profitable, the *breakeven price*, is far for being concluded. Recent estimates for the US tight oil industry as a whole suggest that the price could be $50 per barrel (bbl) on average (Kleinberg 2018). However, Strpić, K., *et al* (2017) notice that the most productive area in the US, the Permian basin in Western Texas,[5] is resilient to oil prices below that level. They estimate that average breakeven prices can reach $31/bbl in Bone Spring formation, $38/bbl in Spraberry and $41/bbl in Wolfcampian formations. Reynolds and Umekwe (2019) make another interesting point, suggesting that shale gas formations also contain small quantities of shale oil. As the probability to succeed in the shale gas exploration processes is higher than in the shale oil, this can be extracted at a relatively lower cost compared with the "conventional" shale oil rigs. Either way, as Oxford Analytica (2017) pointed out, the US production is setting a *cap* on global oil prices in a range between $50 and $60 bbl.

3. The Saudi-Russia price war

According to many market reports, between March and April of 2020 traders witnessed a never-seen-before sequence of events in the history of oil market, which ultimate led the WTI to post a negative price. But many more unusual things happened too, suggesting that the coronavirus lockdowns have disrupted many tacit equilibria in oil geopolitics. That is why those months are already known as "The Saudi-Russia price war".

The price war started in an OPEC summit in Vienna on 5 March 2020 after the drop in oil demand in China, the largest since 2008. At the summit, OPEC Member States agreed to cut oil production by a 1.5 million barrels per day in the second quarter of 2020 and expected to review the policy in the June meeting. OPEC called on Russia and other non-OPEC Members of OPEC+ to abide the decision. But Russia rejected the demand and oil prices fell by 10% soon after the announcement. From the 6th of

[4] According to Baker-Hughes rig count index, provided by Thomson Reuters Eikon. In the charts, rig count data are those of the time series provided by the EIA.

[5] Maps on shale oil and gas plays can be found in the EAI website https://www.eia.gov/maps/maps.htm

March to the 13th of April, the WTI fell by 45%. In the days between the 14th and 20th of April, the WTI fell from $20.1 to $-37.6 despite the agreement that had been reached. In early June, WTI is close to $40 signalling that the OPEC+ agreement is working despite the reduction in global oil demand.

As a result of the Russian move, the Saudis started to pump oil into the global markets at a daily rate never seen before. On 10th March, Saudi Arabia announced an increase its production from 9.7 million to 12.3 million bpd. Soon after, Russia planned to increase oil production by 300,000 barrels per day. Media reports refer that Aramco was pumping about 12 million bpd and that was planning to expand this to 13 million.[6] The planned increase in the combined production of Russia and Saudi Arabia was of 2.7 million bpd while the world's oil consumption was plummeting by 10 million bpd in March 2020, according to the US Energy Information Administration (EIA). Moreover, from December 2019 to April 2020, the world's oil consumption collapsed by 22 million bpd (about 18%). There is little doubt that both contenders *expected* the market crash, and they both knew that they would suffer the consequences. Then, the question is, *why go to a price war*?

Many commentators suggested that the US shale industry was the main target of the Russians. Their rejection to cut production was seen at that time as a retaliation act to the sanctions imposed on Rosneft[7] -Russia's largest oil company- by Trump's administration in February 2020. However, figures do not match with that interpretation. There is little doubt that the Kremlin was aware of the efficiency gains in the US oil sector. Data released later by the EIA show that the US crude oil production in the 4th week of May (Mon. 18-Fri-22) was 11.4 millions of barrels per day, still above the weekly average of 2018. So, starting an oil price war to punish the US oil shale industry is not a winning strategy for Russia. Moreover, although they can benefit from a collapse of the US shale industry in the very short term, the Kremlin needs the oil price well above $60 bbl to balance their accounts. And at that level the US producers will return to the market, so self-inflicting a short-term cut in oil revenues has is little sense for the Russians.

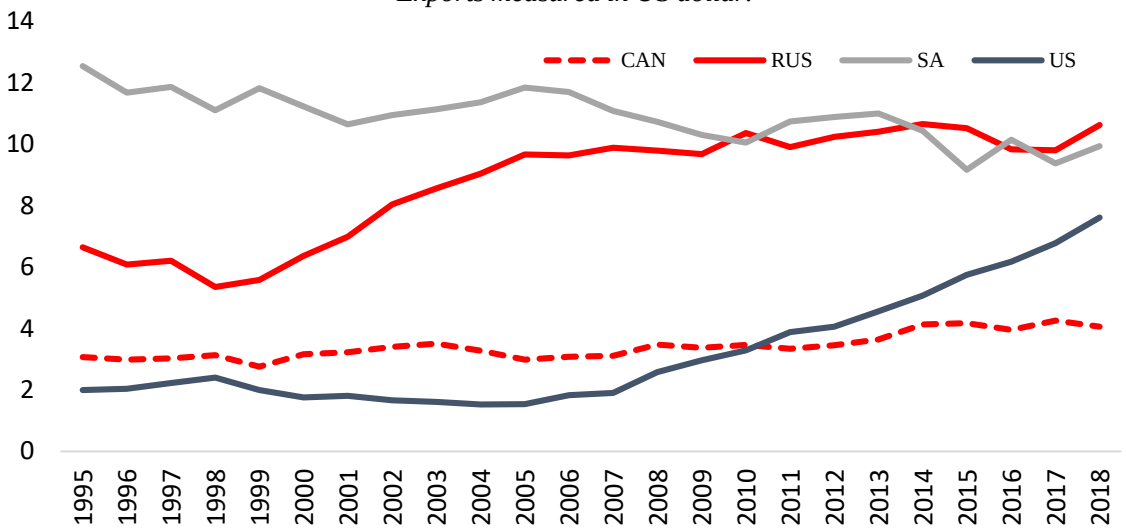
4. Is the "Great Game" changing in the Middle East?

Market and geopolitical motivations seems to be the ultimate causes of the oil price war. The apparently irrational behaviour of the Russians and the Saudis should be regarded against the backdrop of the complex web of forces that interact in the global oil market *and* in the Middle East. The disruptive character of the pandemic just triggered a sequence of actions and reactions which are difficult to understand without considering those forces, including the role US. The shale revolution has changed both the export markets and the status of the US in the Middle East. Ansari (2017) shows how these factors usually shape the behaviour of Saudi Arabia in similar episodes, as in the 2014 oil crash, and not profit maximization nor game theory strategic considerations. This section analyses their role in the last oil price war.

Russia and Saudi Arabia keep a dominant position in the global oil market, although their market share has stagnated since 2008. Their combined share of nearly 20% over total exports in 2018 has remained almost unchanged for a decade. By contrast, the US have more than tripled their share over the same period, almost reaching the Russian and the Saudis' share (see chart 5). The momentum of the US production in early March 2020 did not anticipate a decline in that trend, as their output reached a record-high level.

[6] "Saudi Aramco doubles down on output hike as price war intensifies", *The Financial Times*. 16 March 2020.
[7] "Russia Takes Aim at U.S. Shale Oil Producers". *The Wall Street Journal*. 13 March 2020.

Chart 5. Share in global oil exports (%)
Exports measured in US dollar.



Source. UNCTAD database.
Note. Canada exports are included because they are mainly embarked through US ports.

The geographical breakdown of the market shares shows that the epicentre of the price war could be in China. Russia has gained 10 pp of market share in China's oil imports since 2008, whereas Saudi Arabia has lost 8.8. pp (Table 1) over the same period. The partnership between Russia and China has recently been extended with the construction of additional natural gas pipelines connecting Siberia fields with the Chinese gas network. This is not a minor victory: Chinese oil imports are expected to keep on expanding over the coming decades, contrary what could happen in the US –the biggest oil producer- and Europe –embarked in the New Green Deal- (see chart 6). The OPEC meeting was held when the lockdowns started in Western Europe and the covid-19 outbreak seemed to recede in China: *Russia had the opportunity and the incentive to reap some additional advantage in the Chinese market*. The aggressive reaction of Saudi Arabia was not fully irrational: with the global oil demand shrinking by 18% due to the lockdowns, the fight for Asian markets was key to counterbalance the Russian move.

Table 1. *NET CHANGE IN IMPORT SHARE. 2008-2018*

	CHN	FR	DE	IND	IT	JP	KOR	NDL	PLN	ES	TKY	AVERG
RUS	10.8	-3.3	7.0	1.2	-11.4	1.4	5.6	-4.6	-6.9	-3.9	-2.8	-0.6
SAU	-8.9	8.6	-0.7	-3.4	3.8	9.3	-3.8	1.4	7.0	2.7	0.7	1.5
US	2.7	3.4	-0.2	3.7	3.9	2.1	5.1	2.1	1.2	0.7	-2.6	2.0

Chart 6. Crude oil consumption in BTU
As % of world consumption.

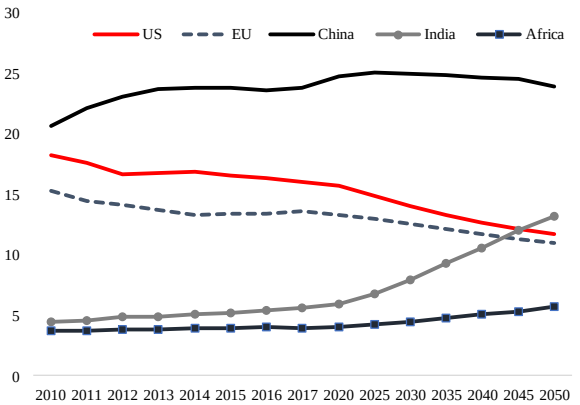
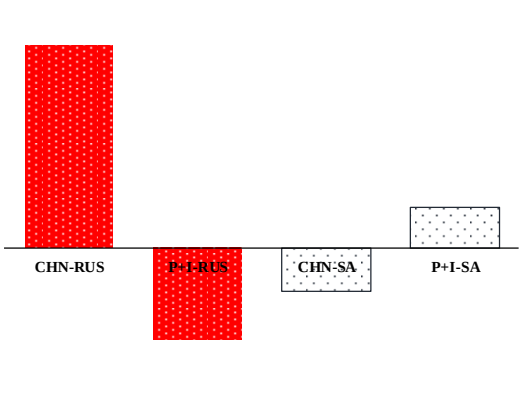


Chart 7. Net variation of exports 2010-18
Billions of USD



Source. EIA for chart 6 and UNCTAD for chart 7 and author's estimates.
Notes: BTU stands for British Thermal Units,[8] in which the EIA provides both data and forecasts. In chart /, P+I-RUS stands for Russian oil exports to Poland plus Italy, P+I-SA same but from Saudi Arabia.

But the victory in China cannot conceal the stagnation of Russia's oil exports in key trade partners. Russia has lost market share in most of the big economies of the European Union with the exception of Germany. The drops in 7 pp in Poland or 11.4 in Italy seem particularly worrying for Russia, as Saudi Arabia has gained some share there (see chart 7). It is true that the gain in China more than offset the combined loss in Italy and Poland. But losing market share in Poland will have not been considered as a good omen in the Kremlin. The same can be said for Saudi Arabia: it has lost ground in India in favour of a remote producer, the US. So both players have similar motivations to engage in a price war.

However, the expected negative impact of ultra-low oil prices on Russia and Saudi Arabia's economies suggested a quick end of the price war. Price wars over market shares are usually short-lived: contenders know that they have too much to lose. The key benchmarks to assess the relative strength of the contenders in the oil market are the so-called fiscal and external *breakeven* prices.[9] According to the IMF, for Saudi Arabia these prices are $76 and $44 respectively. For Russia, the fiscal breakeven stands at $44, allowing more room for manoeuvre in a price war *a priori*. Additionally, the relative level of foreign exchange reserves is also considered. In May 2020 Russia's reserves stood at $427,469 million, very close to those of Saudi Arabia, $490,560 million (Jan 2020 data).[10] However, in relative terms, Russian reserves represent about 25% of its GDP, very far from the 62% in the case of Saudi Arabia, whose reserves *per capita* ($14,556) triple those of Russia ($3000). So Saudi Arabia could bear a longer period of ultra-low oil prices, although the havoc in its fiscal balance could be sizeable: -9.2% in 2018, after several years ranging between -14.8% and -8.9% of its GDP due to the oil price collapse in 2014.

Beyond pure market considerations, geopolitical tensions could have also played a role in the price war. On 14 September 2019, the oil processing facilities of Abqaiq and Khurais were partially destroyed in a drone attack that force Aramco to shut down half of the Saudis' oil production. The Houthi Movement in Yemen claimed the responsibility of the attack and Iran was also accused of being involved. However, a UN report did not find clear evidences of both claims. A second wave of geopolitical tension erupted in December 2019. The 27th of December, Russia, China and Iran held joint naval drills in the Gulf of Oman. On the 29th the Hezbollah Brigades[11] attacked the US embassy in Baghdad. The crisis seemed to

[8] "A British thermal unit (BTU) is a measure of the heat content of fuels or energy sources. It is the quantity of heat required to raise the temperature of one pound of liquid water by 1 degree Fahrenheit at the temperature that water has its greatest density" (EIA definition)
[9] Nothing to do with the *breakeven prices* in oil industry. These are the oil prices at which government budget and current account will balance.
[10] Latest data available in Reuters Thomson Eikon.
[11] An Iraqi Shia paramilitary group that belongs to the Popular Mobilization Forces, supported by Iran.

finished with an Iranian missile strike on US military bases in Iraq after the US killed the general Qasem Soleimani. Quite surprisingly, there was no retaliation by the US. If some kind of tacit agreement was reached between Washington and Teheran, nothing was made public. But sure that the seemingly growing weakness of the US in the area did not go unnoticed for the Saudis.

Russia and China growing influence over Iraq and Iran could have also entered into the Saudis assessments after the OPEC meeting in March. Market reports[12] suggests that Russia is gaining leverage in Iraq as *Rosneft* has taken control over oil and gas fields the semi-autonomous region of Kurdistan. There are also reports that Chinese companies are operating on a number of fields in south Iraq, as part of the *Belt and Road Initiative*, giving China direct access to the Middle East oil fields. Saudi Arabia could be interpreting these movements in its neighbourhood as a twofold threat, *both military and economic*. By setting the global oil price in a price war, the Saudis could be defending their status of regional superpower in the Middle East and showing that they are still able to wreak havoc on both the US and the Russian oil industry.

5. References

Ansari, D. (2017) "OPEC, Saudi Arabia, and the shale revolution: Insights from equilibrium modelling and oil politics" *Energy Policy* 111: 166–178.

EIA (2020) "Short-term energy outlook," 9 June. https://www.eia.gov/outlooks/steo/report/global_oil.php

Kleinberg, *et al* (2018), "Tight oil market dynamics: Benchmarks, breakeven points, and inelasticities", *Energy Economics* 70 (2018) 70–83.

Morris, G., (2019) "South Louisiana Vertical" *Oil & Gas Investor*; Houston, Jan 2019:1.

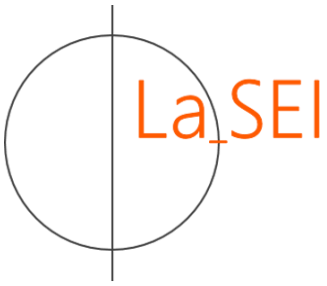
O'Sullivan, M., (2013) *The Entanglement of Energy, Grand Strategy, and International Security*, Chichester, England: John Wiley & Sons, Ltd.

Oxford Analytica (2017): "Oil rebalancing but US shale caps price" *OxResearch Daily Brief Service*; Oxford [Oxford],13 Sep 2017: 1.

Reynolds, D. B., and Umekwe, M. P., (2019) "Shale-Oil Development Prospects: The Role of Shale-Gas in Developing Shale-Oil" *Energies*, 12: 3331;

Strpić, K., *et al* (2017) "Development of Tight Oil Resources in the USA: Exploitation Costs and Effect of Macroeconomic Indicators in a Volatile Oil Price Environment" *The Mining-Geology-Petroleum Engineering Bulletin* UDC: 622.1:620.9

[12] Watkins, S., "Is Iraq About To Become A Chinese Client State?" *oilprice.com*, 8 Jan 2020. https://oilprice.com/Geopolitics/Middle-East/Is-Iraq-About-To-Become-A-Chinese-Client-State.html



Reports de Inteligencia Económica y Relaciones internacionales

[ISSN 2660-7352]

PUBLICACIONES DE LA ESCUELA DE INTELIGENCIA ECONÓMICA DE LA UAM


La_SEI
School of Economic Intelligence
Escuela de Inteligencia Económica
Universidad Autónoma de Madrid