

OIL PRICE SHOCKS AND ITS EFFECTS ON INFLATION

Sorina MOCIAR COROIU, Diana Elisabeta MATICA

Finance and Accountancy Department, Faculty of Economic Sciences, University of Oradea, Oradea, Romania

sorina_coroiu@yahoo.com

maticadiana@yahoo.com

Abstract: *The conflict between Russia and Ukraine had macroeconomic effects, caused especially by the sudden changes in the energy market. These destabilizations came on an economic background, already affected by the Covid-19 pandemic. We examined how the facts that happend lately had any influence on the global energy and oil market. On the other hand, we analyzed the connection between the changes of the oil prices and the level of inflation. This connection has been explored in the 1970s-1980s, when there was registered a great growth of the oil prices. In 2021, inflation began to register significant increases. We wanted to see how this trend of increasing inflation was influenced by the recent events from the oil market. We discussed how these changes determined the inflationary tension in the last period and how was the transmission of oil supply shocks in the US and Euro Area. The price of unrefined oil is not included in the calculation of the direct basket of inflation, but it is indirectly reflected in fuel prices, which determine the increase in transport costs and automatically lead to a series of price increases on the goods and services market. The objective of central banks to maintain price stability is very important, but also difficult, because every country can react differently to oil supply shocks.*

Keywords: *Oil price, energy price, inflation.*

JEL Classification: *E31, G01, Q43.*

1. Introduction

The link between oil price fluctuation and inflation fluctuation initially has been explored in the 1970s and early 1980s, when was registred a great growth in the oil price and inflation automatically increased.

In 2021, inflation started to increase a lot. The main factors that contributed to this upward trend were: overheated markets, supply chain disruptions, changes in consumer demand for goods and services, rising food and energy prices (Baumeister, 2023). One of the main factor of influence in the last period was the change in the price of fuel, respectively of electricity, on the background of the outbreak the conflict between Russia and Ukraine. We want to see to what degree the change in the oil price was a factor of influence for the level of the inflation rate. Economists like Liu (2022), Baumeister (2022), (2023), Hasenzagl (2022) analyzed the fluctuation of the energy price and its influence on the macroeconomy.

The relationship between the change in inflation and the change in energy prices depends on specific economic and market conditions. Sudden changes in energy prices, resulting from sudden changes in demand and supply on the energy market, cause fluctuations in the prices of goods and services, thus influencing inflation in one sense or another.

2. Global oil market

In recent years, global macro economy was shaken by the Covid-19 pandemic, started in 2020, followed by Russia's invasion in Ukraine, in 2022. These events have considerably remodeled the energy market in the last three years, with a great impact on macroeconomic variables and on political decisions. In Figure 1, we analyzed the variation of oil production in the period 2018-2023, for USA, Russia and Saudi Arabia, these being the top 3 producers worldwide.

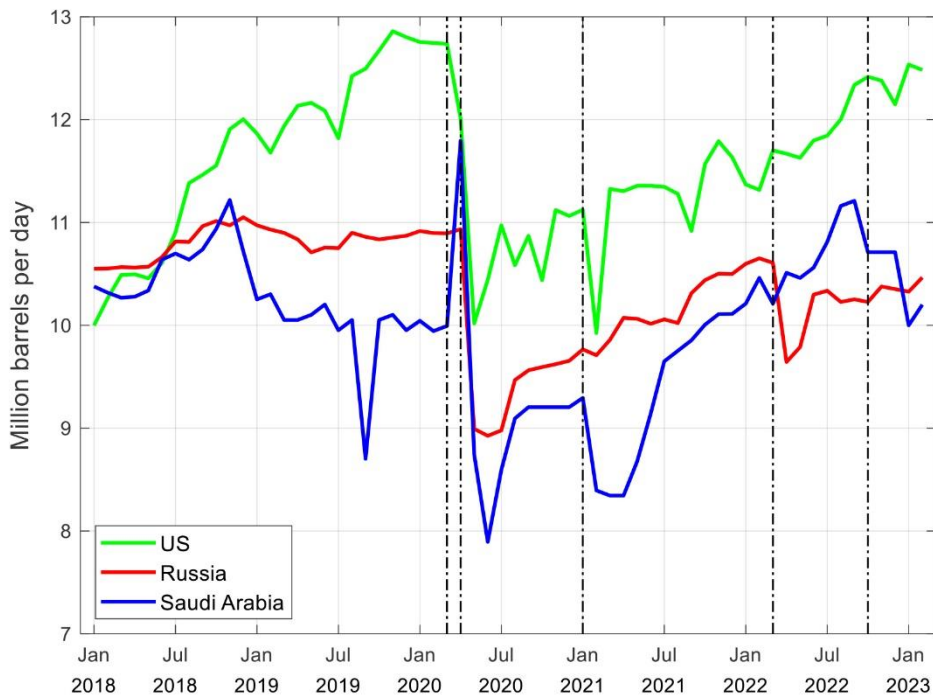


Figure 1: The evolution of oil production, 2018-2023
Source: Baumeister, 2023

When pandemic started, there were numerous shutdowns worldwide. Because of this, the demand for oil has fallen dramatically and the US production falling by nearly three million barrels per day in two months. The sharp decrease of global oil made

that OPEC+ to call for oil production cuts. But Russia initially refused to cooperate with OPEC+ to stabilize oil prices, which triggered a price war between the two main oil exporters, Russia and Saudi Arabia.

„OPEC+ is an informal alliance between OPEC member countries and ten other oil-producing nations, established in 2016. Russia is the main participant, given that it accounts for about 13% of global oil production. In April 2020, Saudi Arabia increased oil production as a punishment for Russia's non-compliance. Saudi Arabia flooded an already oversupplied market with nearly 2 mbpd of crude oil, sending oil prices lower” (Baumeister, 2023).

Lately, in April 2020 OPEC+ created an agreement to decrease oil production by 10%, in order to drive up the oil price. But this stabilization lasted only a short time, because at the beginning of 2021, the second wave of restrictions due to the pandemic came. The following year, in February 2022, Russia attacked Ukraine, which caused a drop in its oil production of about 1 mbpd, which was partially reversed as Russia developed new export markets. After Saudi Arabia increased production above pre-pandemic levels, in October 2022 OPEC+ announced a production cut of 2 mbpd, with the aim of stopping the drop in oil prices. This drop in prices was caused by the fear of recession, due to the tightening of monetary measures by the world's major central banks (Baumeister, 2023).

Saudi Arabia cut oil production to 10 mbpd, reaching its pre-pandemic average. Until February 2023, US and Russian oil production has not returned to pre-pandemic levels (Baumeister, 2023).

Time period	<i>Actual real oil price growth</i>	<i>Oil supply shock</i>	<i>Economic activity shock</i>	<i>Oil consumption demand shock</i>	<i>Oil inventory demand shock</i>
	(1)	(2)	(3)	(4)	(5)
April-Aug 2020	87.7	47.8	10.8	24.6	0.8
Oct 2020-Oct 2021	67.1	10.2	6.8	51.9	-2.1
Dec 2021-Feb 2022	25.7	5.0	5.6	15.0	0.1
March 2022-June 2022	19.9	12.4	-3.2	11.0	-1.3
June 2022-Sept 2022	-31.9	-4.3	1.2	-25.0	-2.8
Oct 2022-Dec 2022	-14.6	2.2	-2.3	-11.4	-1.8

Table 1. Oil Price Fluctuations, 2020-2022

Source: Baumeister, 2023

3. Russian oil market

After Russia's invasion in Ukraine, the Russian oil market suffered. Several European countries imposed sanctions on Russia and refused to buy oil from it. More and more countries in Europe began to buy North Sea oil, from the United Kingdom and Norway, thus increasing imports from the US. Russia has reoriented its oil export to Asia, especially India, competing directly with Saudi Arabia and the Gulf countries. Due to the war, several international energy companies withdrew from Russia, such as Shell, ExxonMobil and BP. Oil service companies such as Baker&Hughes, Schlumberger, Halliburton also withdrew. These withdrawals also affect Russia from the perspective of the lack of technological knowledge, which can affect its progress.

4. Policy measures and stability in the global oil market

Following the Russian invasion, the major oil-importing countries devised a set of political instruments, with the aim of ensuring stability on the world oil market and to fight against the global inflationary pressures.

Even if in the USA, Canada and Australia, oil imports from Russia are small, they have completely stopped Russian imports of crude oil.

In May 2022, EU member states banned most Russian oil imports, due to the EU's heavy dependence on Russian energy. The EU embargo referred in particular to purchases of oil by sea. Before the outbreak of war, almost half of Russian crude oil exports were headed to the EU (Baumeister, 2023).

The G7 countries introduced the price cap mechanism for internationally recognized shipping services, including insurance, shipping and brokerage for Russian goods.

Some analysts have questioned the effectiveness of the EU embargo and of the price cap, as Russia has been able to find alternative buyers and maintain or even increase seaborne export volumes.

5. Oil prices, energy prices and inflation

In the first phase, the effects of the oil price increase will be felt in the price of oil-related products and the price of other energy goods and services that are part of the consumption basket. The price of unrefined oil is not included in the calculation of the direct basket of the inflation rate, but it is indirectly reflected in fuel prices, which determine the increase in transport costs and automatically lead to a series of price increases on the goods and services market.

The prices of refined products, such as gasoline and diesel, do not change in the same percentage as the oil price. The price of gasoline and diesel also depends on refining, marketing and distribution costs, as well as taxes, which differ from one period to another. It has been observed that in general, a sudden increase of 20% in the price of crude oil is reflected by a 10% increase in the consumption price of gasoline (Kilian and Zhou, 2023).

Other indirect effects may also occur. Sudden changes in the price of oil are very visible to the population, so they expect an increase in inflation. Thus, they will tend to negotiate their salaries, in relation to the level of inflation, in order to preserve their purchasing power. On the other hand, companies will increase their profit margins, precisely to counteract future inflationary effects. Such effects largely depend on the credibility of the monetary policy and the ability of the central banks to forecast a level of inflation as realistic as possible.

Central banks are concerned not only with the evolution of consumer price inflation during oil price shocks, but especially with inflationary expectations. The sudden price change on the oil market is expected to cause inflation in the short term, but the major concern is whether it also causes inflation in the long term.

A study by Kilian and Zhou (2023) analyzed the ways in which energy price shocks are transmitted to inflation (figure 2).

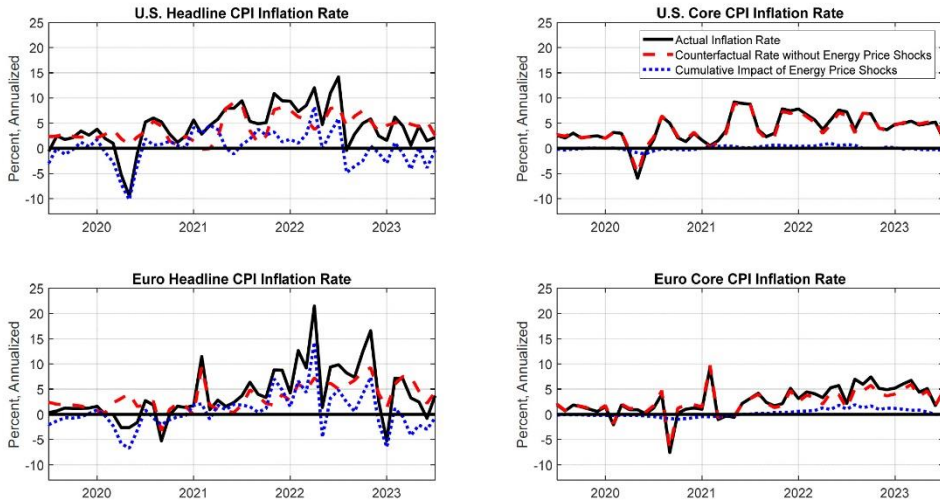


Figure 2. Cumulative Contribution of Consumer Energy Price Shocks in the U.S. and Euro Area, 2019-2023
 Source: Kilian si Zhou, 2023

The change in the price of energy determined the biggest increase in basic consumer prices in the EU and in Great Britain. In Japan, inflation is less influenced by energy price shocks. The sudden changes in energy prices influenced inflation in the EU in period 2021-2022 to a greater extent than in the USA. There is no evidence for US or UK that energy price shocks have substantially modified inflation on long term (Kilian and Zhou, 2023).

Table 2 shows the effects of oil market shocks on consumer price inflation (Baumeister, 2023).

Time period	Actual change in inflation	Contribution of		Breakdown of contribution of demand shocks into		
		<i>oil supply shocks</i>	<i>demand shocks</i>	economic activity	oil consumption	oil inventories
	(1)	(2)	(3)	(4)	(5)	(6)
(a) United States						
Feb-Oct 21	4.5	0.10	1.42	0.13	1.24	0.05
Dec 21-Feb 22	0.8	0.03	0.31	0.12	0.17	0.01
March-June 22	0.4	0.29	0.06	0.03	0.03	0.00
June-Sept 22	-0.7	-0.15	-0.12	0.27	-0.37	-0.02
Oct-Dec 22	-1.3	0.05	-0.58	-0.27	-0.23	-0.07
(b) Euro Area						
June-Oct 21	2.1	-0.06	1.11	0.26	0.78	0.07
Dec 21-Feb 22	0.9	0.03	0.69	0.37	0.37	-0.05
March-June 22	1.2	0.20	0.22	-0.14	0.31	0.05
June-Sept 22	1.3	-0.08	0.29	0.52	-0.18	-0.05
Oct-Dec 22	-1.4	0.02	-0.24	-0.09	-0.10	-0.05

Table 2. Oil market shocks and inflation, 2021-2022

Source: Baumeister, 2023

6. Perspective

Recently, the monetary policy has adopted more restrictive measures, with the aim of reducing the level of the inflation rate. Rising interest rates are reflected in rising borrowing costs for firms and consumers, which could weaken economic activity and reduce demand for oil.

The ECB's objective of maintaining price stability across the euro area is difficult because member countries can react quite differently to oil supply shocks.

It is difficult to make a forecast, because there are a lot of uncertainties in the global oil market and it remains to be seen how they will evolve in the medium term.

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