**H1 Economics 2018 – CSQ – Demand and Supply – Q3**

# Global Oil Market

**Figure 1: US crude oil production and World oil price**

million barrels US$

350

140

300

120

250

100

200

80

150

60

100

40

50

20

0

0

Left Axis: US production of crude oil (Millions Barrels)

Right Axis: World oil price (US$)

Source: U.S. Energy Information Administration, accessed 1 Aug 2017

# Extract 1: How has shale oil affected the global oil price?

Only a few years ago, many observers expected a steadily growing global shortage of crude oil. This shortage did not materialize in part because of the rapidly growing production of shale oil in the US. The production of shale oil exploits technological advances in drilling. This process is used to extract crude oil that would have been impossible to release by conventional drilling methods designed for extracting oil from permeable rock formations. Shale oil production relies on the availability of suitable drilling rigs and skilled labour, which is one of the reasons why the US shale oil boom so far has been difficult to replicate in other countries.

US shale oil production has grown from about 0.4 million barrels a day in 2007 to more than 4 million barrels a day in 2014. The International Energy Agency projected that the US would become the world’s leading crude oil producer, overtaking Saudi Arabia by the mid-2020s and evolving into a net oil exporter by 2030.

It may seem that the change in the global price of oil after mid-2014 may be attributable to sharp increases in US shale oil production, providing direct evidence of the impact of the US shale oil revolution on oil prices after all. Although shale oil is not being exported, it replaces US crude oil imports, reducing the demand for oil in global markets. Similar price declines also occurred in other industrial commodity markets at the same time, suggesting that the cause of the oil price decline has not been specific to the oil sector, but that it mainly reflects a weakening global economy in Asia as well as Europe. This view is also consistent with the comparatively small magnitude of US shale oil production on a global scale.

Source: World Economic Forum, 14 Jan 2015

# Extract 2: Falling oil prices: Who are the winners and losers?

Global oil prices have fallen sharply over the past seven months, leading to significant revenue shortfalls in many energy exporting nations, while consumers in many importing countries are likely to have to pay less to heat their homes or drive their cars. From 2010 until mid-2014, world oil prices had been fairly stable, at around $110 a barrel. But since June prices have more than halved.

# United States: Fracking boom

"The growth of oil production in North America, particularly in the US, has been staggering," says Columbia University's Jason Bordoff. He added that US oil production levels were at their highest in almost 30 years. It has been this growth in US energy production, where gas and oil is extracted from shale formations using hydraulic fracking that has been one of the main drivers of lower oil prices.

# Japan: Mixed blessings

Japan imports nearly all of the oil it uses. But lower prices are a mixed blessing because high energy prices had helped to push inflation higher, which has been a key part of Japanese Prime Minister Shinzo Abe’s growth strategy to combat deflation.

# Russia: Propping up the rouble

Russia is one of the world's largest oil producers, and its dramatic interest rate hike to 17% in support of its troubled currency, the rouble, underscores how heavily its economy depends on energy revenues, with oil and gas accounting for 70% of export incomes.

Russia loses about $2bn in oil export revenues for every dollar fall in the oil price, and the World Bank has warned that Russia’s economy would shrink by at least 0.7% in 2015 if oil prices do not recover.

Falling oil prices has hit the country hard. The government has cut its growth forecast for 2015, predicting that the economy will sink into recession. The government also had to cut its spending. "We had to abandon a number of programmes and make certain sacrifices," said Prime Minister Dmitry Medvedev.

Source: BBC News, 19 Jan 2015

# Extract 3: Fix shale oil production pollution before it gets worse

Scientists, regulators and leaders of Texas' energy industry must identify and understand the environmental risks of shale oil and gas drilling before air pollution or water contamination leads to tighter restrictions that could ultimately derail the rebounding industry, the leader of a broad new study said recently.

The study concluded that the shale oil boom, while enriching companies, residents and state coffers, has also caused earthquakes, degraded natural resources and overwhelmed small communities. The study noted that as many as 96,000 acres were covered by new well pads in 2014 alone, and clearing those pads caused soil erosion and the loss of wildlife habitat. Noticeable earthquakes, which came to Texas just twice a year before 2008, now hit the state 12 to 15 times a year, and some were caused by oil and gas companies injecting millions of gallons of wastewater deep underground.

Energy industry leaders, however, emphasized other findings in the study. The economic impact of oil and gas in Texas has been profound, accounting for an annual gross product of $473 billion as well as nearly 3.8 million jobs.

Source: Houston Chronicle, 19 Jun 2017

# Extract 4: Should the Government Regulate Fracking?

Fracking involves injecting fluids into the ground to access hard-to-reach reserves of oil and natural gas, including shale gas. Many advocates argue that the government should step in and regulate the practice more forcefully because fracking can have big environmental impacts that cannot be managed effectively. At scale, they say, those hazards inevitably become a national problem. The result could be widespread bans on the practice and a premature end to the shale-gas revolution, they say. Currently, the government is strengthening its shale-gas regulations to tighten well- construction and waste-disposal standards.

However, opponents say the risks of fracking are overstated, and the impacts of fracking, both positive and negative, are mostly local, and different people balance them differently. So regulation should be left to the people who feel them most directly.

Source: The Wall Street Journal, 14 Apr 2013

# Questions

# (a) Describe the trend of world oil price from January 2008 to January 2016. [2]

(b) With the aid of a diagram, explain how technological advancements in shale extraction in the US could affect the economy’s production possibility curve. [3]

(c) How far does the data in Figure 1 show that the change in US oil production was the key reason for the change in oil price between January 2013 and January 2016. [4]

(d) Explain the price elasticity of demand for oil in the short run and long run. (4)

(e) Analyze whether demand or supply factors are more influential in determining the price of oil. (8)

1. **Data**

**Characteristics of oil – high degree of necessity of demand – from Ped – dd factor**

1. **Why the price will rise sharply – ped is price inelastic**
2. **Why demand is price inelastic**

**Another reason why the demand factors for oil are more influential in determining price of oil is seen from the influence of the price-inelastic demand for oil. The price rises sharply when there is a decrease in the supply of oil when the demand is price-inelastic, proving that the demand factors like PED have significant influence on the price of oil in short run. There is a high degree of necessity of demand for oil as oil is an essential resource for production of goods and services and this means that the demand aspect of influence is extensive to shape the sharp rise in price of oil.**

**cracking of oil – LR – ss shale of oil**

**Time period for production is long. Pes is price inelastic in the short run**

**PES and Ped are both price inelastic in SR and LR but it is less price inelastic in LR**

**Suggested Answers**

**(a) Describe the trend of world oil price from January 2008 to January 2016. [2]**

One subject – general trend – variation or pattern of change

Two subjects – similarity and differences

It fell from Jan 08 to Jan 16. There is a sharp fall in Jan 2009, Jan 2015 or rose between Jan 2009 to July 2014.

**(b) With the aid of a diagram, explain how technological advancements in shale extraction in the US could affect the economy’s production possibility curve. [3]**

PPC 🡪 axis shift out

Explanation of productive capacity

Technology progress increase the productive capacity of the economy. More of shale oil can be produced with the same amount of resources. (PPC shifts Out)

However, the maximum output of other goods remains the same, as the technology advancement only affect shale oil production. (PPC will not shift out)

Draw diagram – description – the PPC will shift from PPC 1 to PPC 2

**(c) How far does the data in Figure 1 show that the change in US oil production was the key reason for the change in oil price between January 2013 and January 2016? [4]**

Trend

Oil Price fell in the time period as US oil production rose. (1)

Explanation

Rise in production of US oil, fall in demand for imported oil, thus, the demand for oil market fall.

Fall in US demand for oil, surplus, prices also fell. (1)

But it may not be the key reason because the extent of rise in US oil production is rather small as compared to the extent of the fall in world oil prices as seen in figure 1, especially in Jan 2015. Thus, it could be due to other factors such as slowing world economic growth as mentioned in extract 1. (1)

Diagram and description (1)