

Czech University of Life Sciences Prague

Faculty of Economics and Management

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Bachelor Thesis

Foreign Trade: Case Study of Crude Oil in Saudi Arabia

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BACHELOR THESIS ASSIGNMENT

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Economics and Management

Thesis title

Foreign Trade – Case study of crude oil in Saudi Arabia

Objectives of thesis

The thesis deals with the analysis of Saudi Arabia's crude oil. The thesis consists of four chapters. Since crude oil is the motor of Saudi Arabia foreign trade, the thesis in the theoretical part deals with foreign trade and its importance. The last chapter of the thesis is the practical part of the thesis deals with Crude oil of Saudi Arabia. Mainly the analysis evaluates how crude oil influences GDP and its impact on economic sectors in Saudi Arabia. In the last chapter, the thesis attempts to predict the future of the economy and the possible visions of its growth.

Methodology

During the analysis I will use many resources and data bases to make the analysis as deep as possible. Comparative and descriptive methods will be used in the thesis.

The proposed extent of the thesis

35 – 40 pages

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Saudi Arabia, foreign trade, petroleum, exports

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C. J. R. Braithwaite, G. Rizzi, G. Darke: "The Geometry and Petrogenesis of Dolomite Hydrocarbon Reservoirs." 2004, ISBN: 9781862394834

Hilyard, J. The oil & gas Industry; PennWell: Tulsa, Okla., 2012, ISBN-13: 9781593702540

Speight, J. An Introduction to Petroleum 1- Technology, Economics, and Politics; Wiley: Hoboken, 2011, ISBN: 9781118012994

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Declaration

I declare that I have worked on my bachelor thesis titled "Foreign trade: case study of crude oil in Saudi Arabia" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 15th March, 2019

Hidaya Abushawashi

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Foreign Trade: Case Study of Crude Oil in Saudi Arabia

Abstract

This thesis focuses on analyzing how Crude oil has affected Saudi Arabia's economy. As oil is the major source of energy in current times as most of our machinery and assets are designed to work on oil. All the countries depend on oil in some sort of way but, developing countries depends on crude oil more than developed countries as oil is the major source of energy for their economy's growth though more developed countries have more oil reserve stored for in case of emergencies. Saudi Arabia being the biggest exporter of all when it comes to oil and all the problems and price fluctuation that they had to face is discussed in the thesis.

Objective is also to analyze how the international oil market is established including main players in the oil markets, effects of being an OPEC member for Saudi Arabia, discovering key contributors that fluctuate the demand and the prices in oil market and hopefully be able to predict the changes Saudi Arabia will have to make to be a booming industry in the upcoming times where other alternative sources might be an optimal source for the economy. Saudi Arabia depending mostly on crude oil in the past for GDP however, Saudi Arabia cannot keep depending on oil anymore as times are changing therefore, in order to combat this, Saudi is working on Vision 2030 where they only want crude oil to make only 20% of their GDP. Saudi Arabia realizes that even though demand from developing countries is high for crude oil it still cannot solely depend on oil so is now looking for more diverse investments and option to transition from an economy solely based on crude oil to a more diverse one.

Keywords: Oil, oil pricing, oil reserves, oilfield, OPEC, economy, Saudi Arabia, , Vision 2030

Zahraniční obchod: případová studie surové ropy v Saudské Arábii

Abstrakt

Tato práce se zaměřuje na analýzu toho, jak surová ropa ovlivňuje ekonomiku Saudské Arábie. Ropa je v dnešní době hlavním zdrojem energie, většina našich strojů a zařízení potřebují ropu ke svému provozu. Všechny země jsou na ropě nějakým způsobem závislé, nicméně rozvojové země závisejí na surové ropě více než rozvinuté, jelikož ropa je hlavním zdrojem energie pro jejich ekonomický růst, a naopak rozvinuté země mají více ropných zásob pro krizové situace. Saúdská Arábie je největším vývozcem ropy a všechny problémy a cenové výkyvy, kterým musí čelit, jsou rozebrány v této práci.

Cílem je také analyzovat mezinárodní trh s ropou včetně hlavních hráčů na trhu, vlivy plynoucí z pozice Saúdské Arábie jako člena OPEC a nalézt klíčové faktory, které způsobují výkyvy poptávky a cen na ropném trhu. Dále se pokusit predikovat změny, které bude muset Saúdská Arábie udělat pro růst svého průmyslu v nadcházející době, kdy se optimálním zdrojem pro ekonomiku mohou stát alternativní zdroje. Saúdská Arábie, jejíž HDP bylo v minulosti nejvíce závislé na ropě, si už tuto závislost s měnící se dobou nemůže dovolit. Aby tomu mohla čelit, spustila projekt Vize 2030, který stanovuje výši HDP tvořenou ropou jen na 20 %. Saúdská Arábie si uvědomuje, že navzdory tomu, že poptávka po surové ropě v rozvojových zemích je i nadále vysoká, nemůže zůstat závislá pouze na ní a hledá tak odlišné cesty investic a způsob přechodu z ekonomiky závislé pouze na surové ropě na ekonomiku diverzifikovanou.

Klíčová slova: ropa, cena ropy, ropné rezervy, ropné pole, OPEC, ekonomika, Saúdská Arábie, Vize 2030.

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1 Introduction

We have many industries that experience rapid change in a very little time, chief among which is transport and communication, whereas there are others that have remained unchanged for a long time such as industry, trade to name a few.

This first part of the literature review of this thesis will cover a general idea of foreign trade and the terms that are relate to it. Generally speaking, foreign trade has been around for centuries, but its significance has increased in the present time. Foreign trade can be defined as the act of importing and exporting commodities with a given country, which in turn helps build relationships with even more countries across the globe as a result. Market growth is where this form of trade really excels, in addition to exchanging goods. Foreign trade is a good indication of a nation's economy, due to the benefits yielded by selling goods abroad, potentially increasing the GDP of the country. One example would be Saudi Arabia, as foreign trade (mainly oil) contributing for up to 63.4% of the country's GDP, creating the thriving country we now know.

The second part of the literature review of the thesis will introduce the history of oil and factors that affect the oil commodity in the global market. At the top of the list of commodities traded around the world is crude oil. Ancient people are believed to be the first to have unearthed crude oil and used it to make incendiary projectiles fired from cannons. Centuries later, people have discovered the true energy that lies within this fluid and the endless possibilities they were able to achieve. In our current time oil derivatives are so widely used that there is not an object we see or interact with on a daily basis that is not made from oil. A fact so intriguing to the extent of causing many countries in the Middle East to follow on Saudi Arabia's footsteps. In a time where both oil producing and consuming countries are reaping the rewards of this trade with hardly any tangible consequences, it is hard to convince them otherwise.

The second part will introduce the case study of this thesis which is how oil impact on the economy of Saudi Arabia and how it benefits from the oil revenues it receives from exporting its oil to the foreign countries.

2 Objectives and Methodology

2.1 Objectives

The thesis deals with the analysis of Saudi Arabia's crude oil. The thesis consists of four chapters. Since crude oil is the motor of Saudi Arabia foreign trade, the thesis in the theoretical part deals with foreign trade and its importance. The last chapter of the thesis is the practical part of the thesis deals with Crude oil of Saudi Arabia. Mainly the analysis evaluates how crude oil influences GDP and its impact on economic sectors in Saudi Arabia as well as the fluctuation of oil prices and the impact of it in the economy. In the last chapter, the thesis attempts to predict the future of the economy and the possible visions of its growth and whether the country will remain depended on the oil revenues.

2.2 Methodology

This work is divided in two parts being Theoretical and Practical part. In theoretical part the topics that are being discussed are foreign trade policies, importance of foreign trade, terms of trade, trade theories, absolute advantage theory, history and types of crude oil, world crude oil market, factors influencing oil prices, oil demand & supply, main importers and exporters in oil market, OPEC.

While in practical part overview of Saudi Arabia's economy, oil industry, GDP, oil production and exports, trade balance, reserve, consumption, effects of OPEC on Saudi Arabia's economy and oil prices, Vision 2030 is being discussed in order to summarize the effects of crude oil on Saudi Arabia's economy and give us a clear picture for future of oil industry.

The thesis will comprise of descriptive, comparative and historical methodology to study the effects and importance of crude oil as a commodity in Saudi Arabia's economy. The study will also include analytical methods using graphs to determine how oil price fluctuation effects the overall economy of Saudi Arabia negatively or positively.

Based on the analysis presented in the practical part we will conclude, whether we can determine if Saudi Arabia will remain dependent on oil revenues in the long term or replace it with other alternative sources.

3 Literature Review

3.1 Foreign trade

3.1.1 Definition of foreign trade

Foreign trade simply refers to as exchanging capital, goods and services between one country to another. In many countries it characterizes an important share of Gross Domestic Product (GDP). Though Foreign trade has been present for centuries, however, its economic and social importance has been on the rise in this modern era.

It involves usage of currencies of different countries and it is regulated by laws, rules and regulations of the countries. Of course, all countries do require goods, capital and services in order to satisfy their people's needs and wants. Countries have a limited source and the production of goods and services needs resources of course, but no country is able to produce the goods and service that are required. So, it must buy from different countries what they cannot produce or produce less than the requirements. Also, it sells goods to other countries that has in surplus quantities. Generally speaking. Countries are often not self-sufficient. They depend on other counties for the purpose of importing goods that are either not available or available in insufficient quantities. As well as exporting goods that are in excess quantity or that are in high demand outside.¹

Foreign trade consists of two things, export trade and import trade. Export trade is the act of selling goods to other countries. Import trade is the act of purchasing goods from other countries. Foreign trade can be divided or classified into three main groups and they are:²

Import trade: Import trade refers to purchasing or inflow of goods and services from one country to another. Import is certainly important for countries because, for instance, a country may lack in producing a certain commodity, therefore that certain commodity can be purchased from another country.²

¹ <http://www.yourarticlelibrary.com/foreign-trade/the-meaning-and-definition-of-foreign-trade-or-international-trade-explained/5972?fbclid=IwAR2WK0h2YBUZZFrBW0N7C1QptUSQE5uy02itfkS-LypiMg-zJ9fOVNz-ZxM>

² <http://kalyan-city.blogspot.com/2011/03/what-is-foreign-trade-types-and.html>

Exporting trade: Export trade refers to the trade or outflow of goods from home country to another country. If a country produces a certain commodity excessively then the country will be able to trade this commodity and gain profit from exporting it. ²

Entrepot trade: Entrepot trade known as Re-export. It refers to purchase of commodities from one country and afterwards sell these purchased commodities to another country after a few processing operations. For instance, a merchandise might be imported, stored and traded before re-export without the need of paying import duties imposed.²

3.1.2 Importance of foreign trade

For centuries now, nations have been practicing the act of trading amongst each other and it has been going on until this day. Foreign trade is an important factor for the world's economy that allows countries to exchange their goods between each other. This act results in increasing the living standard, making individuals enjoy the variety of different products and it also benefits the gross domestic product (GDP) of a nation. There are several points on the need and the importance of foreign trade to nations.

Raises the living standards of citizens: Imports of goods and services from a foreign country allows people to have a choice in consuming or purchasing new and better varieties of goods and services.²

Encourage economic development: With importing goods, services and technology, a country can witness growth in sectors of economy and elsewhere. For instance, industries service sectors and so on.²

Maintain standards good and quality: It is known that foreign trade is very competitive. For instance, a country that exports its goods to other country it has to maintain the good quality for its goods in order to increase the demand from other countries.²

Helps to gain goodwill and brings good status for the country: Any country that engages in exports, will ear goodwill as well as good reputation in the international market. For example, Saudi Arabia is well known for being the largest export county for crude oil.²

Create good opportunities for employment: Foreign trade benefits a country in creating employment opportunities, by rising the mobility of labor and resources. It creates direct employment in import sector as well as indirect employment in different sector of the economy. For example, Industry, Service Sector etc.²

3.2 Terms of trade

The idea of specialization and exchanging goods and services is very important for countries that trade with each other. Because most countries specialize in producing a certain commodity, in which they have a comparative advantage in, this will lead to the enlargement or enhancement of the production. As David Ricardo suggested in his competitive advantage theory and of course, countries will gain from exchanging with each other. However, in order to profit from specialization and exchanging goods with other countries, it all depends on the term of trade (TOT). This term shows the relationship between how much one country will pay for commodities to be imported and how much money it brings in from exporting their commodities to another country. Economist believe that if the prices of a country's export increases compared to the prices of imports then the term of trade has moved towards a positive direction. This is because the production of one domestic commodity will prioritized over many commodities that are bought from foreign country. However, if the prices of the country's imports increased compared to the export's prices then there has been a deterioration.³

The term of trade in the international economics refers to as, the ratio index between a country's exports prices to the country's import prices.

The term of trade can be calculated in the form of an equation:³

$$\text{Terms of Trade (TOT)} = \text{Index of Export Prices} / \text{Index of Import Prices} \times 100$$

³ <http://www.economicdiscussion.net/trade/calculation-of-term-of-trade-with-formula/6431>

Let's suppose that the United States of America in a certain year can import 10 cars in the exchange of exporting one truck, similarly. And in the following year, 20 cars are exchanged for the same amount of car. Therefore, the term of trade in this case will improve. However, if two trucks were exported for the exchange for 10 cars then the term of trade will be deteriorated.

Since the term of trade is an index, then the base year in an index calculation is always 100. The reason why index is used in this case is because it shows the changes of a country's exports and imports over time. This allows the economist to see whether the exports are earning more or less revenues over time and the same holds for imports. This allows us to see the imports are becoming more expensive or cheaper over time. In reality, both will be constantly changing but by using indexes will give us general picture. For example, let's assume that in 2012 the United States of America had an index of export prices of 120 and the index of import prices of 110, the United States of America's term of trade is 109 which means that there the term of trade is improved. Note that when the term of trade exceeds 100 then there is an improvement but if it gets below 100 it is worsening.

Term of trade can be influenced by numerous of factors such as:⁴

Elasticity of demand and supply: The elasticity of both demand's and supply's exports and imports, has a great significance influence of the term of trade. The term of trade will tend to be favorable in the case if the demand of a country's exports is less elastic in comparison to the country's imports. As for the supply, the term of trade will be favorable if the supply of a country's exports is more elastic in comparison to its imports.⁴

Rate of exchange: the changes in the rate of exchange of a country's currency can also influence terms of trade. For instance, the term of trade of a country will improve if that country's currency appreciates, and therefore the currency's appreciation causes a decrease in the prices of the imports and an increase in the prices of exports.⁴

⁴ http://www.pondiuni.edu.in/storage/dde/downloads/ibiv_ftp.pdf

The importance of term of trade has a great significant in both international trade as well as the country's economic sphere. The idea of unfavorable term of trade would make a country export greater amount of its products, in order for them to import at least the same amount of goods. With unfavorable term of trade, a country will not gain much from foreign trade. On the other hand, a favorable term of trade will increase the country's exports allowing it to purchase imports from other countries in more quantities.⁴

3.3 Trade balance

Trade balance is the difference in the value of exports and imports. If the value of imports is larger than the value of exports, there is a balance of trade deficit. If the value of exports surpasses the value of import, there is a balance of trade surplus. (MAITAH, 2017)

The trade balance can be either referred to as balance of trade (BOT) or international trade balance. It shows the difference between the value of a nation's exports and imports in a specified given time. Most economist depend on the usage of trade balance in order to analyze, understand and measure the strength of one country's economy in relation to other countries. If a country imports goods and services more than it exports then the country has a trade deficit. However, if a country exports goods and services more than it imports then, it has a trade surplus.⁵

The calculation for trade balance can be explained as, total value of imports minus total value of exports. For example, if a country imported 1.5 trillion of goods and services, but exported only 1 trillion in the same year, then this country had a trade deficit of only 500 billion. Whereas if the same country had imported only 750 trillion of goods and services and exports 1 trillion of goods and services then the country had a trade surplus.

So, when a country is facing a trade deficit, it is most likely to borrow money from other countries in order to make purchases of goods whereas, a country that has a trade surplus it is able to lend money to other counties facing trade deficit helping them to buy the goods they need.

⁵ <https://www.investopedia.com/terms/b/bot.asp>

3.4 Trade theories

The concept of foreign trade is the act of exchanging goods and services across the global boundaries. Theories of international or foreign trade are simply designed for the purpose of explaining various ideas of exchanging goods and services between two countries.

The theories have been through numerous changes in order to have a better understanding of how the modern global trade works because of the essence of comprehending the way countries trade with another. Economists have developed several theories in order to explain the mechanisms of international trade. The most important theories are called classical country-based theories, which are captured from the perspective of a country. There are over theories that have been developed later on, however, this chapter will focus on two main theories from the classical country-based theories.⁶

3.4.1 Absolute advantage theory

The absolute advantage theory is the country's or the company's ability to produce goods at a low cost than another country. Or a company that produces similar goods.

This theory was attributed by Adam Smith a British economist who is recognized as the founder of the modern economics and was in favor of the idea of free trade, which gives and advantage of division of labor and specialization in the global trade. His reasons behind this theory were that he believed that countries should trade between one another without regulation or restriction by the government policy, nonetheless trade should mainly flow naturally according to the market forces. Smith had stated that trade does not only come from wealth but rather that wealth is the result that comes from production activities. (Robert M.Dunn, 2000)

According to him, most economic activities such as production is carried out freely because of the supply, demand and the market price fluctuation regulation. Theoretically, this means that if one country is able to produce goods cheaper than another country, then that country with cheaper production gains full advantage with the ability to specialize on producing that specific good and vice versa. The idea of specialization creates effectiveness to countries due to the fact that this will make the country's labor force more

⁶ https://saylordotorg.github.io/text_international-business/s06-01-what-is-international-trade-th.html

productive and skilled at doing the same tasks. Production in this case will become more effective, because there will be motivation in order to generate quick and better production methods to enlarge specialization. (Robert M.Dunn, 2000)

Almost all countries have an absolute advantage in the production of at least one specific good with efficiency and as mentioned before, absolute advantage is accomplished by producing goods at a low-cost. To make absolute advantage more understandable, a specific example is Italy. Italy produces 600 million gallons of wine per year, while France produces only 400 million gallons of wine per year, thus Italy has an absolute advantage in the production of wine over France. Whereas France produces 1.8 million tons of cheese per year and Italy produces only 1.2 million tons per year, therefore, France now has an absolute advantage in the production of cheese. Under these circumstances, both countries should focus only on specializing in the production of the product that these two countries have an absolute advantage of, and trade with one another. With the idea of foreign trade, countries will benefit from one another by exchanging the goods that each country specializes in and has an absolute advantage over. (Robert M.Dunn, 2000)

3.4.2 Comparative advantage theory

The difference between absolute advantage and comparative advantage is that, absolute advantage refers to a country that is able to produce more or better goods in comparison with another country by looking at the absolute productivity. However, this theory can only explain some part of why countries do trade with each other or why they actually have an absolute advantage. Whereas, comparative advantage can explain the reasons on why countries do actually trade. (Robert M.Dunn, 2000)

Comparative advantage is simply an economical term that refers to the country's ability to produce goods at a lower cost compared to another country. Meaning that one country can produce a certain good cheaper than another country, as well as focus on the relative productivity differences. This theory states that the economic welfare of a country will increase due to the specialization in producing certain goods at a relatively lower cost. (Robert M.Dunn, 2000)

Early 19th century, in 1817, the law of comparative advantage was attributed to a famous British economist David Ricardo when he published his famous book “Principles of Political Economy and Taxation”, which presented an accurate overview of the mechanism benefits of international trade. He conducted that a nation should specialize in exporting a specific good, which they can produce more efficiently than any other country and import the other, which that country produces less productively and inefficiently. (Robert M.Dunn, 2000)

Let’s give a solid example to make this theory more understandable. Imagine the United States of America and United Kingdom. The U.S.A is able to make motorbikes and cars, meanwhile United Kingdom can only make motorbikes. In this case, the productivity in motorbike-making for the United States of America is partly superior to United Kingdom. Therefore, the United States of America is only better in making cars and importing motorbikes from United Kingdom, because selling cars makes bigger profit. In another words, the United States of America can buy as many motorbikes as possible as long as it is being imported from United Kingdom and just specialize in making cars. However, if the United States of America only makes car and United Kingdom only makes motorbikes, both these countries can trade the product they make. Hence, the overall production and the consumption of both countries combined together is significantly greater.

To conclude, international trade is beneficial even if one country can specialize in producing a certain commodity cheaply, therefore they have a competitive advantage over other country.

3.5 Trade policy

Foreign trade policy is important aspect to the international trade. It is defined as a governmental action or laws related to exchanging of goods and services that relates to trade relations between countries. The policies are put together by a country’s public offices and are specific for every country. The policies are generally focused on three main

constituents, which are, tariffs, import quotas and export subsidies. These three policies are aimed to enhance the nations international.⁷

Tariffs: tariffs are simply referred to as taxes that are placed on imports that function as any other taxes. The nation has all the right to force tariffs or taxes of the imported goods. Once the tariffs are added up to the price of the imported goods, it will lead to the price of the imported goods to become higher, thus declining the amount of purchasing. This will result in increasing or encouraging the purchase of the domestic goods and protect the nation's industry.⁷

Import quotas the import quotas are simply a restriction in which a government sets a limitation of imports on the quantities of different and specific goods, services or actives, that are imported from a foreign country. Import quotas are typically given a certain period of time, which is often one year. An example of import quota is US government setting a limit to the import of Japanese cars by 1 million per year. Restriction imports may be satisfied by a first-come-first-serve basis meaning that when the total is obtained then an import of that specific product will not be allowed.⁷

Export subsidies: subsidy is a payment, which is made by the government sector, may be for consumer or a business which is not expected to receive production as an exchange. Furthermore, these subsidies are given to support a certain activity. Moreover, export subsidies are paid subsidy given to local producers designed to encourage exports to foreign sectors. It is highly effective to boost the overall income that is given by domestic companies when exporting production.⁷

Trade policies in any country in the world are also divided in two types of policies based on the application's scope.⁸

National trade policies: is the idea that the government controls the nation's foreign trade in order to protect the best of their trade and their citizens.⁸

⁷ http://www.amosweb.com/cgi-bin/awb_nav.pl?s=wpd&c=dsp&k=foreign+trade+policies

⁸ http://www.economywatch.com/international-trade/trade-policy.html?fbclid=IwAR0gxu0UjxvY8AOQHk59V7BUM2FY5_zkRcPuL1g3o91_kM5ZXV4h8dvdSY

International trade policies: these policies are the ones that are not applied within the nation itself. However, it is done within the abroad system to organize the global trade. Generally, the trade agreements are done by the most international trade organizations such as Organization for Economic Co-operation and Development (OECD) and World Trade Organization (WTO). Their aim is to support the developed and still developing countries as well as to unleashing the global trade from numerous restrictions.⁸

3.6 History of crude oil

The discovery of oil has been a vital one for the world we live in as most of our technology depend on it hence making oil one of the most vital source of energy. Developed and developing countries relies on it for various forms of production.

Crude oil is recorded to be an ancient invention. It is believed that our ancestors were very well aware of the importance of using oil around their time. It is said that oil had been used in for production ever since ancient Persia and the civilization of Babylon (2,000 B.C.). The oil and its viscus forms, bitumen, that made their way to the surface of earth in oil seeps, has been used for thousands of years as a waterproof agent in order to be used in plumping, boat building and other. Persians have also used paraffin oil that is obtained from raw oil as a source of lighting around 600 B.C. Another civilization that has been known for using oil is ancient China. However, finding oil in ancient China was difficult because the oil was hidden very deep underground which makes the process of obtaining it not easy. To get to it, they used similar method as it is used in the modern era of oil rigs by building oil drill. They managed to dig deep down underground about 243 meters below the earth surface and achieve getting oil. They managed to dig deep down underground about 243 meters below the earth surface and achieved getting oil. The usage of oil in the Chinese era was mainly for the purpose of heating and lighting. Other ancient civilization in 10th century believed that crude oil could be used as a medicine. First oil export was from Venezuela in the year 1539 and was intended to as a gout treatment for the Holy Roman Emperor Charles V.⁹

⁹ <http://www.ancientpages.com/2018/06/28/how-and-when-did-ancient-people-start-using-oil/>

Before the discovery of oil in the modern era, people were heavily relying on the usage of coal. However, after oil was discovered, industries and households immediately replaced coal with oil. It was around the 1850's when many refineries were built for the purpose of turning oil into kerosene for lamps and fuels machines. Apart from that, oil was very important around the twentieth century because it helped the production of automobile that relied on the usage of gasoline and diesel.

Several years later, oil was first discovered by the very first oil corporation, known as Pennsylvania Rock Oil Company of Connecticut, that was later changed to Seneca Oil Company. To allocate oil, the company hired Edwin L. Drake, who became the first person to discover oil in 1859 in Titusville, Pennsylvania.¹⁰

A decade or two after the World War II, a high number of organization and companies were formed in pursuit of various goals some were there to stop oligopoly of oil market & some were there to enforce it. One company that was there to help these oil rich countries maintain better and long- term prices & not make mistakes over short term competition was OPEC (Organization of Petroleum Exporting Countries) which was created in 1960 and OAPEC (Organization Arabic of petroleum exporting countries) created in 1968. These organization have given power to the sellers of oil by maintaining the supply and demand in regard to the industry.¹¹

Oil is the main source of energy for a high number of industries. Space industries would make an excellent example as though most industries have been searching for a renewable source of energy and some of them are quite close to it. One example would be Automobile industry. Since Tesla's breakthrough with electric cars quite a high number of companies are trying to copy it on other way of transportation like Trains, Truck etc. However, Space industries still entirely depends on oil as source of energy to launch their boosters from earth and most experts suggest that the industry will continue the use of oil as energy for at least the upcoming century.

¹⁰ <https://www.history.com/topics/industrial-revolution/oil-industry>

¹¹ <https://hbr.org/1980/11/world-oil-and-cold-reality>

That was just one example and there are many other industries who entirely depend on oil as energy hence making crude oil a necessity of the world. Therefore, helping the countries rich with this natural resource with international trade. Oil is not only an important source of energy; however, it also became the main source for at least thousands of different industrial commodities. Despite the fact that many industrialized countries are attempting to cut down the usage of oil and replacing it with other sources of energy such as renewable energy (solar and wind energy) and other permanent energies but oil will remain a strategic commodity that controls the future of the world as well as its economy and it is also an important commodity for the international trade.

3.6.1 Types of crude oil

crude oil is a natural phenomenon composes of hydrocarbon deposits and other organic materials that formed from the fossil of animals and plants that have been living on earth for million years. (Hilyard, 2012)

The properties of oil may vary in terms of proportion of hydrocarbon elements, sulfur content and so on, as it is extracted from different geographical locations all over the world. Crude oil can differ from one country to another. the crude oil in the African countries may differ from the oil in the European countries, the oil in the U.S.A can also differ from the oil in the Arab countries. There are also different types of oil can be classified based on the American Petroleum Gravity (API) and by the sulfur content. There are three types of crude oil by API gravity, Light Crude, Medium Crude and Heavy Crude Oil. It can also be defined based on its sulfur content; the identification can be defined as sweet oil or sour be classified as shown in the tables below with examples of the products: (Speight, 2011)

Table 1: Types of crude oil by API Gravity and products

crude oil types	oil products	API Gravity
Light Crude Oil	jet fuel, motor fuel	31.1 ° or higher
Medium Crude Oil	diesel oil, gas oil	22.3 ° - 31.1 °
Heavy Crude Oil	fuel oil, asphalt	below 22.3 °

(<https://www.plainsmanmfg.com/blog/four-main-types-crude-oil/>)

Table 2: Types of crude oil by sulfur

Crude oil	Sulfur content volume
sweet oil	lower than 0.42%
sour oil	higher than 0.50%

(<https://setxind.com/upstream/in-depth-look-at-crude-oil/>)

3.7 World crude oil market

Three components form this market of oil producers, consumers and a place of trading. The division of the market and the nature of the market is the difference between these three different parts of the market. Numerous parts of oil devised from these components can be viewed as monopolistic or oligopolistic.

Even being produced by only a handful of companies throughout the world with also being quite far from where most of the oil is consumed trading in oil is considered one of the best businesses of the world. Making crude oil one of the greatest economical commodity. Over three-fourth of entire international oil is being delivered by sea means of transport in supertankers.

Worldwide events may and have impacted the price of production & exporting one major example would be the attacks on world trade center known as September eleven attacks the details of this event fluctuated the price is discussed further in the practical part of this thesis. Crude oil being a commodity which is shipped all over the world therefore the price is also affected by international supply and demand. The prices of oil are growing as the demand in developing country for the oil is growing hence the prices in other countries are also growing because there's a high demand in developing countries so if Non- developing countries desire to acquire oil as a source of energy the prices with the developing countries must match.¹²

3.7.1 Crude oil exporters

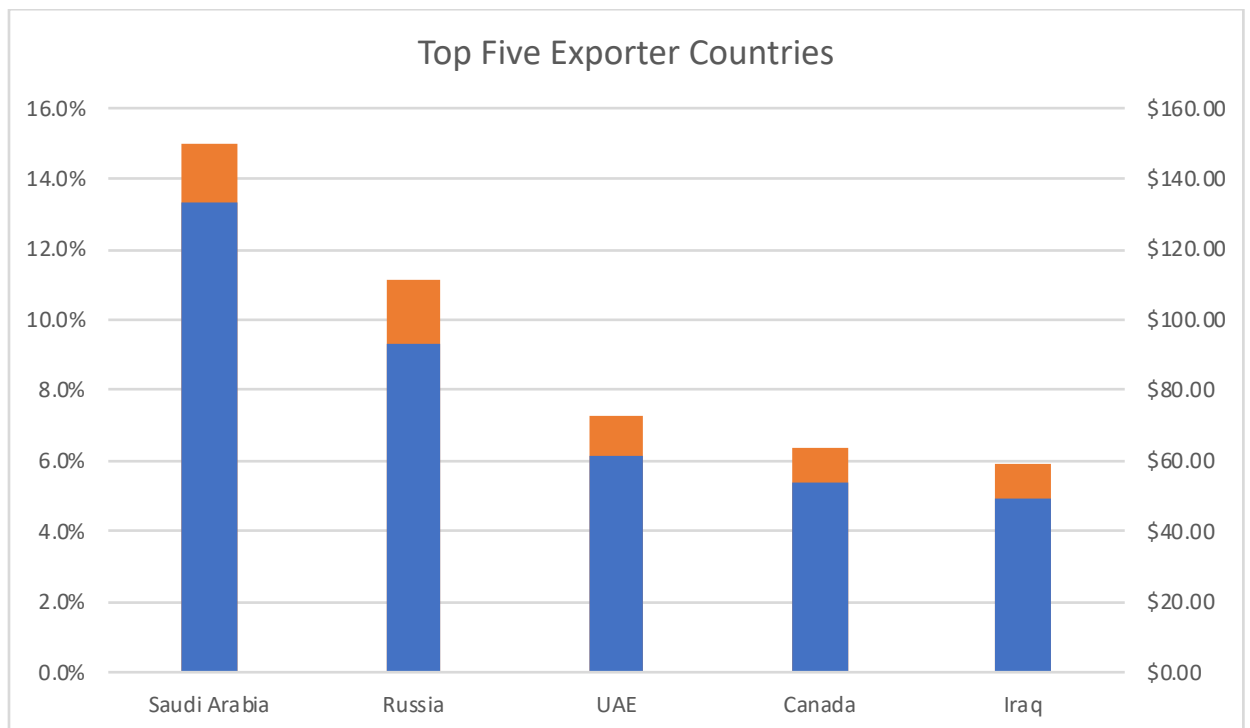
In this present day, our society and industry do rely on the usage of crude oil. The Middle Eastern countries are known for being the important countries for exporting crude oil. Middle Eastern countries considered to have the highest dollar value worth of crude oil exports in the year 2017 with 42.4 % of globally exported crude oil. At the continent level, almost half of crude oil exports comes from the Asian countries which accounted 49.4 %. Europe supplies about 18 % of the overall total, followed by Africa at the rate of 13.4 % and lastly North America at 11.4 %.¹³

Saudi Arabia is known for being the largest country to export crude oil, holding about around 18 % of the world's proven petroleum reserves. It is responsible for about 15.9 % of the world total crude oil export with the total of US\$133.6 billion in value. The second largest exporting country for crude oil is Russia responsible for about 11.1 % of the total crude oil export having a total of \$93.3 billion in value. The graph below shows the top five countries for crude oil export in the year 2017.¹³

¹² <https://www.e-education.psu.edu/eme801/node/455>

¹³ <http://www.worldstopexports.com/worlds-top-oil-exports-country/>

Graph 1: Top five exporter countries of crude oil



(<http://www.worldstopexports.com/worlds-top-oil-exports-country/>)

3.7.2 Crude oil importers

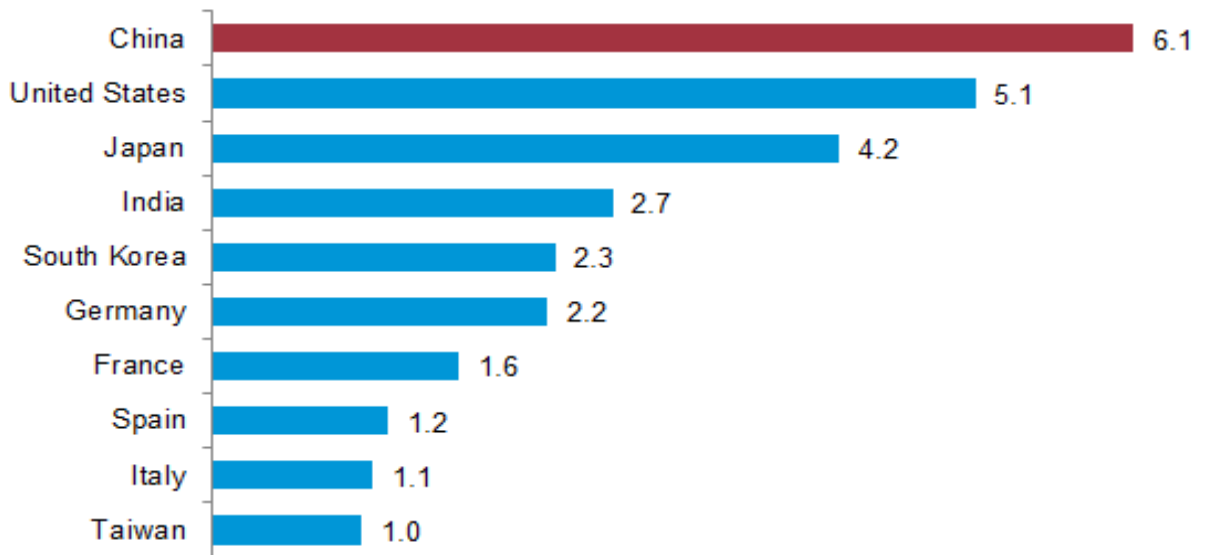
crude oil is considered to be one of the main sources of energy in the world since the 1950 apart from other energy resources such as coal, and renewable energy. According to the EIA (U.S Energy information administration) it is forecasted that the production of crude oil will remain until 2030 and 2050. ¹⁴

The biggest crude oil importer countries are, China follows by the United States according to EIA (U.S Energy Information Administration). According to their data china had become the world largest importer of total crude oil and other liquid fuels in 2013. In 2014, the country's average total net oil imports reached 6.1 million bbl/d. In 2017, China had imported 8.4 million barrels per day (b/d) as well as, 56% of China's crude oil imports came from countries within the Organization of the Petroleum Exporting Countries (OPEC). China's consumption is expected to increase by 0.4 million b/d in 2018, followed

¹⁴ <https://www.eia.gov/outlooks/aeo/data/browser/#/?id=12-AEO2019&cases=ref2019&sourcekey=0>

by a 0.3 million b/d increase in 2019. The two figures below demonstrate how China did in the year 2014 in importing crude oil¹⁵

Graph 2: Top ten crude oil importers, 2014
Top ten annual net oil importers, 2014
million barrels per day



Note: Estimates of total production less consumption. Does not account for stock build.
Source: U.S. Energy Information Administration, *Short-Term Energy Outlook, May 2015*

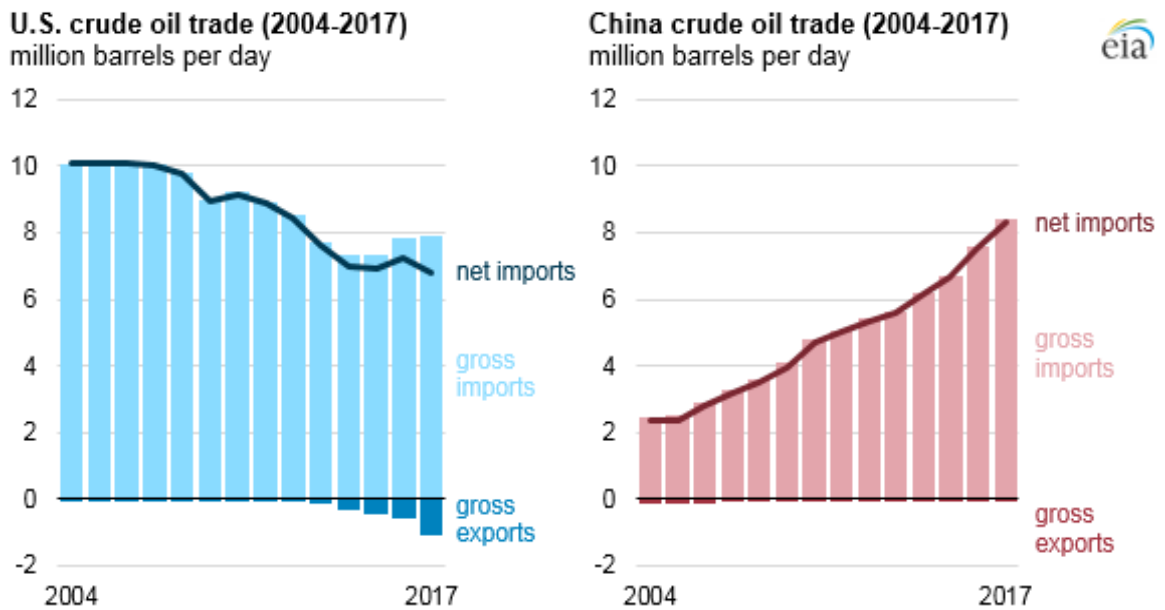
(<https://www.eia.gov/beta/international/analysis.php?iso=CHN>)

The U.S is the second largest crude oil importer is U.S. In 2014 it is estimated that the country's average oil imports reached to 5.1 million barrel per day (b/d). in 2017 it imported 7.9 million barrel per day (b/d). the production of crude oil in the U.S. averaged an estimated 9.3 million barrels per day (b/d) in 2017 and it is forecasted by the EIA to have an average of 10.3 million b/d in 2018.¹⁶ The second figure shows the comparison between China and the United States net import in the year 2017.¹⁶

¹⁵ <https://www.eia.gov/beta/international/analysis.php?iso=CHN>

¹⁶ <https://www.eia.gov/todayinenergy/detail.php?id=34812>

Graph 3: Comparison between China and USA



(<https://www.eia.gov/todayinenergy/detail.php?id=34812>)

3.8 Factors influencing oil price in the world oil market

crude oil is one of the most important commodities in the world. The price of it, can affect the economical ecosystem as well as affect the nations GDP. The price of oil in the world market are affected by numerous factors, some of these factors are supply and demand which play a big role in the shift of prices of oil.

3.8.1 Oil supply

Large number of factors affect oil supply. Already existing volume of oil in different geographic regions around the world would be one.

Two of main factor of oil supply would be described by one being current supply and output and other is future supply and reserve. Current supply is being decreased as most oil organization are planning to decrease the production of oil of their members in order to influence the prices of oil and find a better rate for this commodity. Decisions like this will lead to global decrease of oil supply. The other part being future supply and reserve. Countries with a higher level of production and consumption also tend to have higher reserve of oil that helps their economy flourish in case of emergency such as increase in

prices etc. As being a non-renewable source of energy, the commodity known as crude oil might become rare as other forms of energy looks to take over so countries prefer to stockpile oil when prices are down. For example, Countries like Venezuela and Saudi Arabia have a large oil reserve that can be used optimally in time of need.¹⁷

Weather may also influence in the oil supply for the globe. According the (EIA) many of hurricanes that appeared in the year 2005 led to close down crude oil production as well as refineries hence the number of suppliers declined and the prices went through the roof. Suppliers also prefer supplying to extreme cold weather as more oil is needed to keep valuable things or humans living in temperatures that are suitable for living thus in process burning more oil and hence needed more oil than usual driving the prices up.¹⁷

Other conflicts have also raised the prices of oil. A famous example would be the conflicts in Libya in the beginning of 2014 that restricted the exports of oil from this huge country. An incident like this decreases the global level of oil increasing prices of oil as the commodity becomes scarce. Another example could be several years long ongoing struggle happening in Syria and with the involvement of Islamic State of Iraq & Syria the exports have come to a halt again rising prices for oil in international market.¹⁸

China demand for oil have been growing as rapidly as their economy mostly because the two things are interconnected. This leads to a higher supply as well because more exporting countries wants to make profits by supplying to china. However, the effects of all these problems tend to be short lived as these problems fade away the prices return to their former state.¹⁸

3.8.2 Oil demand

Oil demand is high in developing countries because oil is a source of energy to produce other products that this developing country depends upon to float their economy and run machinery to increase gross domestic products etc. In short oil is viewed as an asset as it increases production capacities of a country.

¹⁷ <https://blog.smarttouchenergy.com/factors-affecting-oil-prices>

¹⁸ <https://oilprice.com/Energy/General/Top-Five-Factors-Affecting-Oil-Prices-In-2015.html>

Even though more developed states are trying to reduce their usage of Crude oil and switch to renewable source of energy such as wind power, electricity etc. Scandinavian Countries would be a good example of this because even after being the second biggest exporter of oil Norway is still putting efforts to have a completely renewable sources of energy in pursuit of this ambition, they have given incentives to buy electric cars as with electric cars a person can enjoy free parking, no vehicular tax etc. But developing economies still makes a great market place of crude oil as the oil resources are required for agriculture and industrial growth. Even though the world wants to shift to renewable sources for energy in purpose of protecting the external environment this transition will be slow.¹⁹

One more major factor for demand in various countries is how fast are they looking for economic development in their country as the countries who have used crude oil extensively as seen major economic development in these previous years as crude oil is one of the widely available resources to be used as energy which in turn helps economic growth by fueling several industries and it does not require innovation as most of the machinery, tools and assets that are available in the present day and age programmed to use oil as a source of energy whereas worrying about the consequences of oil use on environment will require innovation and will halt the growing economies therefore, when compared to more developed countries, the developing ones focus more on the pace of economic growth and is more prone to using oil as a resource. This can be seen as china being one of the greatest global consumers of oil also being one of the highest growing economy. The price elasticity of demand of Crude oil also plays a major role as demand change as there are positive and negative fluctuation of prices.²⁰

3.9 Organization of Petroleum Exporting countries (OPEC)

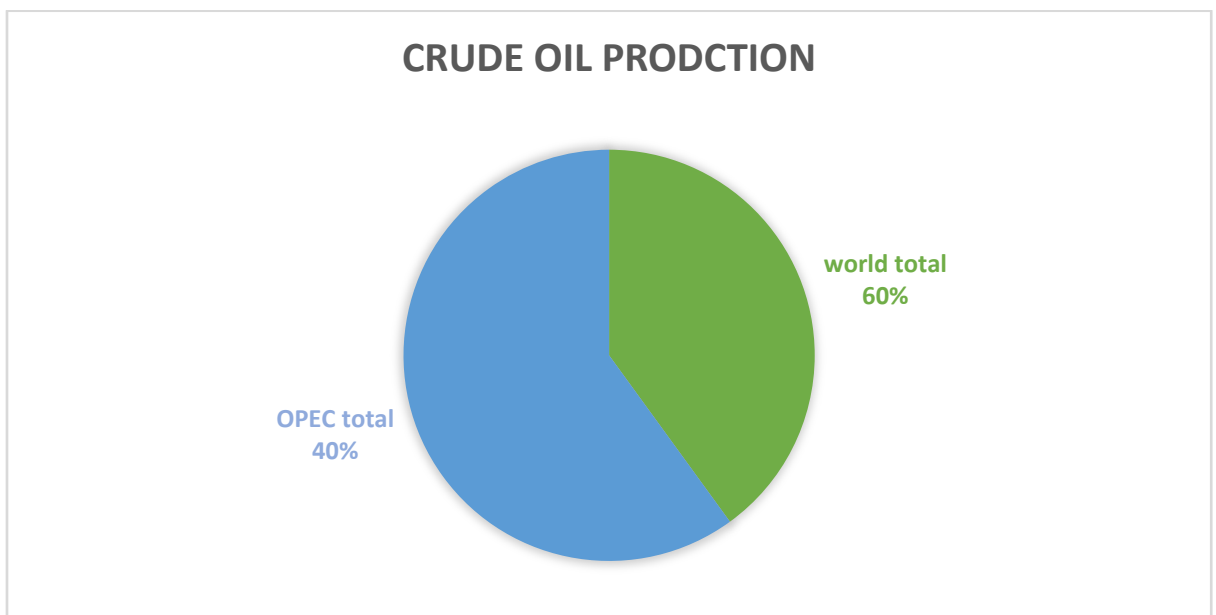
Organization of Petroleum Exporting Countries is one of the most important organization in the world that focuses on exporting of oil. It was first established in 1960 founded by five countries, Iran, Iraq, Kuwait, Saudi Arabia and Venezuela. And was founded at the Baghdad Conference. Later on, ten other countries had joined the organization which are

¹⁹ <https://www.investopedia.com/articles/investing/072515/top-factors-reports-affect-price-oil.asp>

²⁰ <https://oilprice.com/Energy/General/Top-Five-Factors-Affecting-Oil-Prices-In-2015.html>

Libya, Indonesia, the United Arab Emirates, Algeria, Nigeria, Ecuador, Gabon, Angola, Equatorial Guinea, Congo, and Qatar, however Qatar had left OPEC in 2019. At the beginning of the organization, its headquarters was located in Geneva, Switzerland for its five years of its establishment however, in the year 1965 it was moved to Vienna, Austria.²¹The organization produces 40 % share of the world oil production, nonetheless OPEC also controls 60% of the global oil exports.²² The figure below, show the amount OPEC produces oil in barrel per day whereas the world total of oil production is only 40 % barrel per day.²³

Figure 1: OPEC total crude oil production

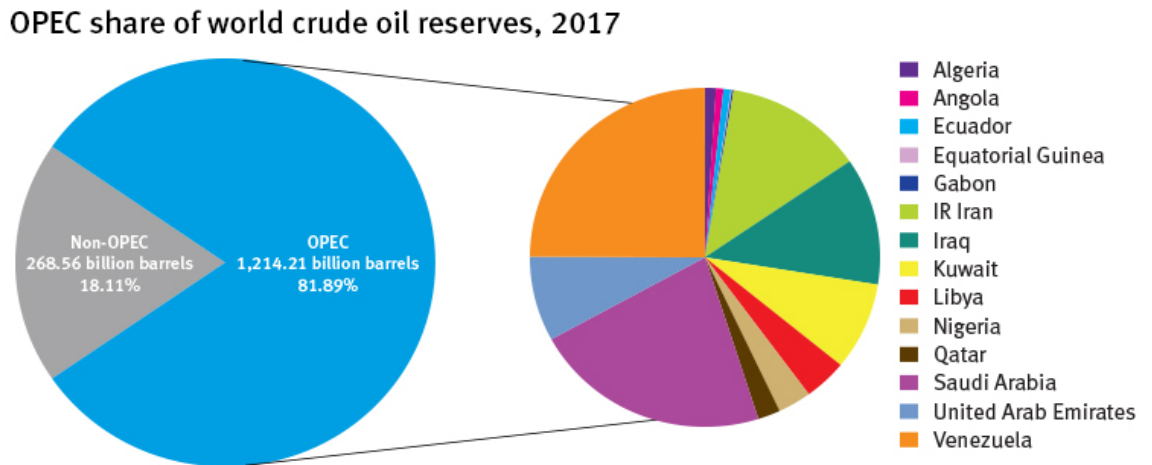


(<https://www.eia.gov/finance/markets/crudeoil/supply-opec.php>)

According to the latest estimation in 2017, OPEC members holds about 80 % of the total oil reserve in the world standing at 1,214.21 barrel per day as shown the figure below.

²³ https://www.opeec.org/opeec_web/en/about_us/24.htm

Figure 2: OPEC share of world crude oil reserve, 2017



OPEC proven crude oil reserves , at end 2017 (billion barrels, OPEC share)

Venezuela	302,81	24,9%	Kuwait	101,50	8,4%	Qatar	25,24	2,1%	Gabon	2,00	0,2%
Saudi Arabia	266,26	21,9%	UAE	97,80	8,1%	Algeria	12,20	1,0%	Equat. Guinea	1,10	0,1%
IR Iran	155,60	12,8%	Libya	48,36	4,0%	Angola	8,38	0,7%			
Iraq	147,22	12,1%	Nigeria	37,45	3,1%	Ecuador	8,27	0,7%			

Source: OPEC Annual Statistical Bulletin 2018.

(https://www.opec.org/opec_web/en/data_graphs/330.htm)

“The mission of the Organization of the Petroleum Exporting Countries (OPEC) is to coordinate and unify the petroleum policies of its Member Countries and ensure the stabilization of oil markets in order to secure an efficient, economic and regular supply of petroleum to consumers, a steady income to producers and a fair return on capital for those investing in the petroleum industry”.²⁴

Based off of the statement above, it can be conducted that the main goal of the organization is mainly to ensure the stability on the world’s oil market. For the organization to succeed, it sets certain roles to its exporting members to safeguard the oil prices so that the producers can benefit more. OPEC also aims to handle to possibilities of shortage and surplus into the oil global market.

OPEC holds great power as by placing a ceiling for production for their members it can cause deep impact on global oil prices as the supply of a commodity is low the prices seem to rise. OPEC members also enjoy a profit as they are now selling low quantity of oil for

²⁴ https://www.opec.org/opec_web/en/about_us/23.htm

same price or selling same quantity of oil for higher profits. This idea was first introduced to the organization in 1982 and ever since it has been a major tool in OPEC policies. As now in 2017 the organization have decreased the production for about 1.2 million per day to profit around 35.7 million barrel a day.²⁵

²⁵ https://newsblaze.com/business/how-does-opec-control-the-price-of-oil_91072/

4 Practical Part: Case study of crude oil in Saudi Arabia

4.1 Overview of oil industry in Saudi Arabia

In the beginning of the 20th century, specifically 1908, Persia (now Iran) was the first Middle Eastern country where crude oil was discovered. The discovery was made by a British company while seeking for an energy source, making Persia their main suppliers for oil at that era. The discovery of oil in that region did not only discontinue there however, further search and exploration of oil showed that neighbor countries possess crude oil too.²⁶

The uncovering of oil in Persia was an indication of a possibility of the fact that there might be found more oil in the whole region; specifically, the Arabian Peninsula. Around the 1920's, the first Arabian Peninsula oil was discovered in Iraq (1927), Bahrain (1932) and Saudi Arabia (1938). Of course, later on, many other discoveries were made in countries nearby.²⁷

In 1932, Standard Oil Company of California (Socal) was interested in discovering oil in Saudi Arabia. The company had signed a concession in order to gain the right to explore crude oil around that area. Later that year, it assigned its concession in its newly formed operating subsidiary, California Arabian Standard Oil Company (CASOC) by then, agreement was efficiently active. Geologist had begun the exploration process for several years however the sought for oil was unsuccessful until the year of 1938 where oil was successfully found. The discovery of oil in Saudi Arabia had completely opened a new era for the country and for the world. The company was later on changed to Arabian American Oil Company (Aramco).²⁷

Aramco also known as Saudi Aramco, plays a major role in Saudi Arabia's oil production. It is the largest oil producing company in the world, producing about two to three million barrels a day. It manages the country's oil reserves, and supplies more than 10% of the oil demand. According to their official website, the company produces mainly five different

²⁶ <https://www.geoexpo.com/articles/2008/06/the-emergence-of-the-arabian-oil-industry>

²⁷ <http://countrystudies.us/saudi-arabia/40.htm>

types of oil: Arabian heavy, Arabian medium, Arabian light, Arabian extra light and Arabian super light oil.²⁸

4.2 Saudi Arabia's economy

Overview of Saudi Arabia:

Saudi Arabia or Kingdom of Saudi Arabia (KSA) is the largest country in the Middle East, the fifth largest in Asia, the second largest in the Arabic world and the 12th largest country in the world. It is surrounded by the Arabian Gulf on the East and by the Red Sea on the West. Saudi Arabia was established in 1932 by King Abd-al-Aziz. The country is divided into 13 provinces, and Makkah and Madinah provinces are the holiest lands in the country, Al Jawf and Riyadh being the capital.²⁹

Saudi Arabia has an area of 2.24 million square kilometer (864,869 Square Miles) with the population of 32 million, according to the statistics of 2018, their official currency is Riyal and the official language of the country is Arabic.

Saudi is an official member of OPEC, it is one of the main founders of the organization, established in 1960, a member of the World Trade Organization (WTO) (since 2005), the Gulf Cooperation Council (GCC), the United Nations (UN) and many other global institutes.

4.2.1 Saudi Arabia's Gross Domestic Product (GDP)

Gross Domestic Product (GDP) is the total money value of everything produced within the country during a year. even if the production is produced by citizens or foreigners, and they are located within the country's boundaries, their production is included in country's GDP. (MAITAH, 2017)

Saudi Arabia has one of the largest economies in world. It ranks the 19th largest due to its economic stability, its oil exports and oil revenues. Generally speaking it is also considered one of the richest Middle Eastern countries where it comes in the fifth place after Bahrain.

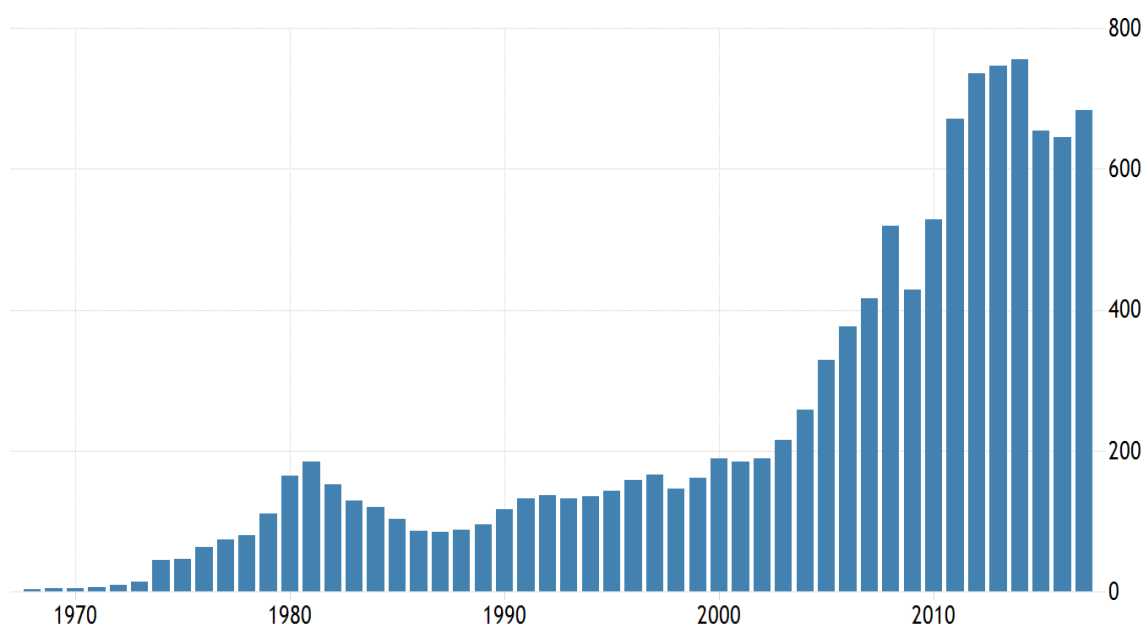
²⁸ <https://www.saudiaramco.com/en/who-we-are/mega-projects/manifa>

²⁹ <https://www.stats.gov.sa/en/4025>

With Saudi Arabia being the largest country in oil production, the oil sector plays an important role in the growth of the country's GDP accounting for 40%. Throughout the years, the GDP of the country had increased year after year. According to the statistics, in the year 1968, the GDP was recorded at 4.19 Billion USD and ever since then, it started to change. Around the year 1974, the GDP gradually changed and became steady. Since 2002, it started to grow reaching at 519.8 Billion USD in 2008, as you can see in the graph below. The highest price the GDP reached to was 756.35 Billion USD in the year 2014. In 2017 the GDP was worth 683.83 Billion USD and generally it averaged 232.81 Billion USD from 1968 until 2017.³⁰

The figure below demonstrates the GDP in Saudi Arabia from 1970 until 2017.

Graph 4: Saudi Arabia's GDP



(<https://tradingeconomics.com/saudi-arabia/gdp>)

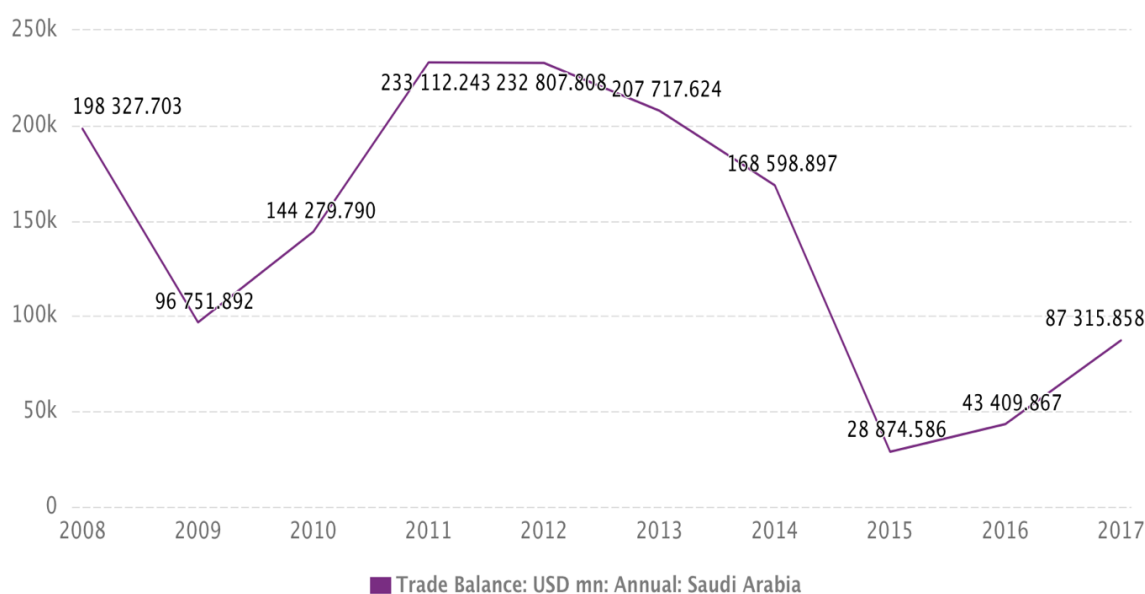
4.2.2 Trade balance of Saudi Arabia

According to CEIC data, in the year 2017, the country recorded a trade balance of 87.3 Billion USD in comparison to the previous year with the surplus of 43.4 Billion USD. And in 2015 Saudi Arabia had faced a major deficit in its trade balance because of the over

³⁰ <https://tradingeconomics.com/saudi-arabia/crude-oil-production>

production and the decrease in its oil production causing a deficit of 16%. The average value of the trade balance of Saudi Arabia is estimated to be 20.3 Billion USD from the year 1957 to 2017. The highest value it had reached was in 2011 recorded at 233.1 Billion USD and the lowest was in the year of 1957 recorded at 30.8 Million USD.³¹

Graph 5: Saudi Arabia's trade balance



(<https://www.ceicdata.com/en/indicator/saudi-arabia/trade-balance>)

4.3 Crude oil exports

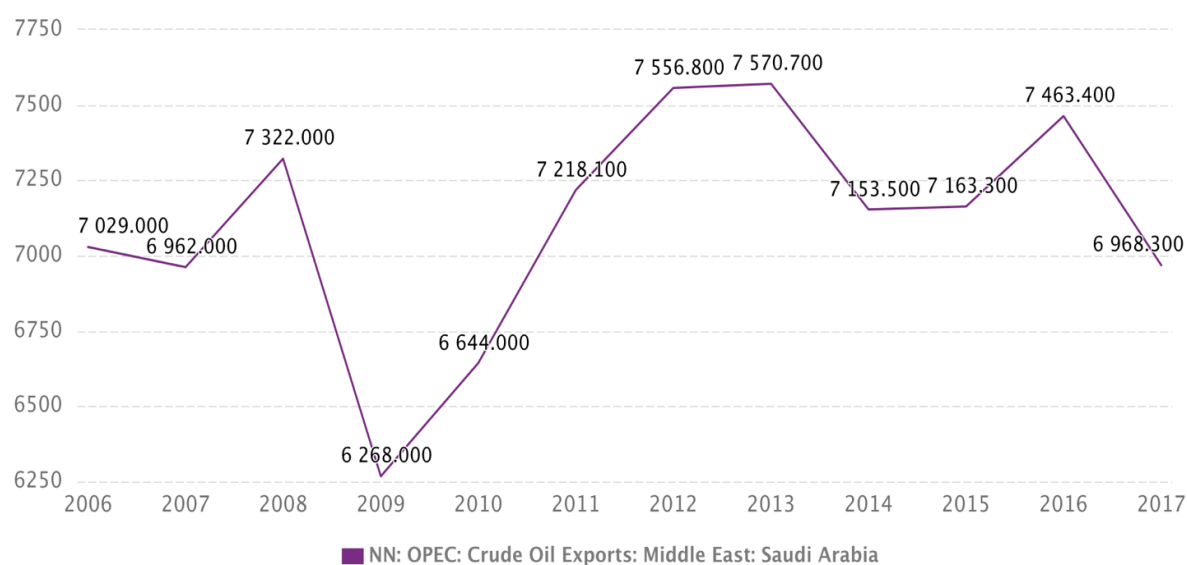
The economy of Saudi Arabia depends on several production such as the production of natural gas, minerals however, it mostly depends on the production of crude oil since it is the largest source in the country. The economy of the country depends on exporting its oil production to other countries to gain from the revenues received for its economy. Since the country is large in oil production and holds large quantities of oil reserve, oil accounts for about 85 % to 90 % of exporting revenues and roughly about 80 % of the government revenues.³² The Saudi Aramco is the main company in producing and exporting oil consisting of several types crude oil that Saudi Arabia exports which are Arab Heavy, Arab Medium, Arab Light and Arab Extra Light.

³¹ <https://www.ceicdata.com/en/indicator/saudi-arabia/trade-balance>

³² <https://www.ispionline.it/it/pubblicazione/saudi-arabias-oil-dependence-challenges-ahead-14997>

According to CEIC the exports of oil in December of 2017 accounted for 6,968.300 Barrel/Day, however this was a decrease compared with the export of December of 2016 which was recoded at 7,463.400 Barrel/Day. The average export of the country is estimated at 6,813.100 Barrel/Day from 1995 until 2017. The most favorable year the country had exported was in year 2013, recorded at 7,570.700 Barrel/Day and the least year it exported was 2002 reached at 5,284.600 Barrel/Day.³³

Graph 6: Saudi Arabia's crude oil export



(<https://www.ceicdata.com/en/indicator/saudi-arabia/crude-oil-exports>)

4.3.1 Main importers

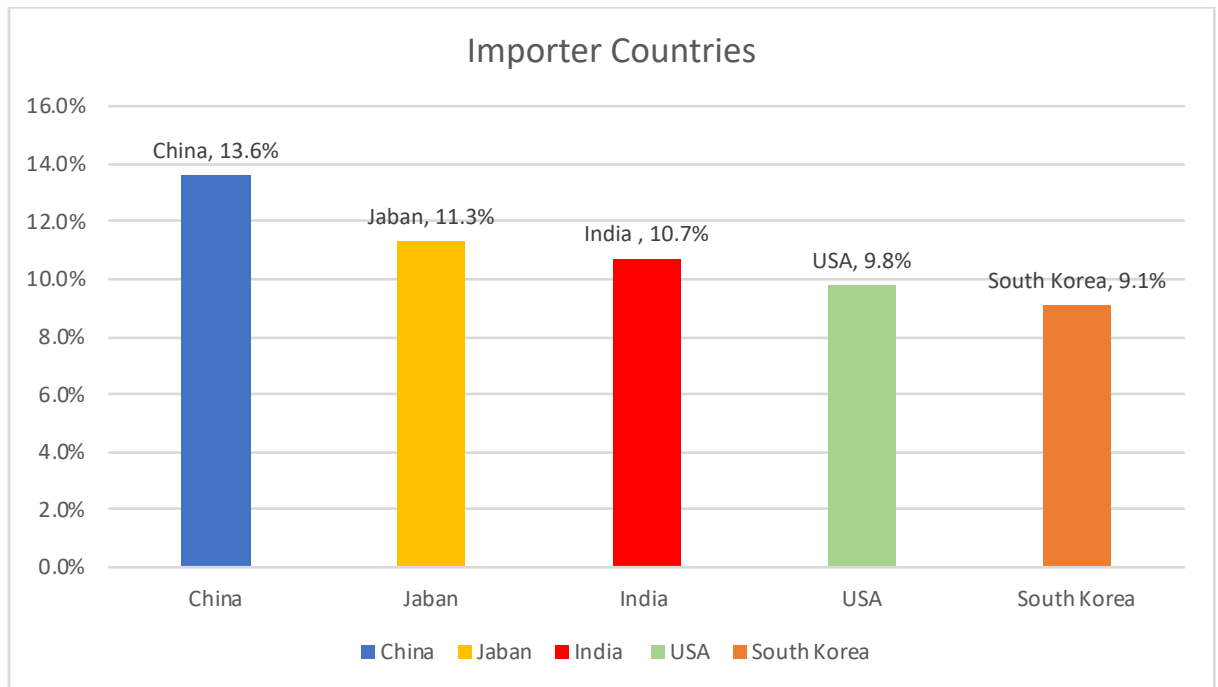
The main countries that Saudi Arabia exports its oil to are China, Japan and the USA. China imported about 13 % of crude oil from Saudi Arabia valuing about 26.7 billion USD in 2017. According to the statistics, china had imported about 8.65 Barrel/Day in the first half of the year 2017. In the first ten months of 2018 it had imported 1.04 million Barrel/Day. The second importer partner is Japan. About 11 % of Saudi Arabia's crude oil is exported there in 2017. Japan had imported about 1.295 million Barrel/Day in the year of 2017 making Asia the largest and a favorable geographic group in importing oil from Saudi Arabia.³⁴

³³ <https://www.ceicdata.com/en/indicator/saudi-arabia/crude-oil-exports>

³⁴ <https://www.reuters.com/article/us-column-russell-crude-china/china-india-oil-imports-show-saudi-arabia-is-already-carrying-the-burden-of-cuts-russell-idUSKBN1AA28S>

The United States of America accounts for 9.8 % of the Saudi Arabia oil export and it had imported 943,000 Barrel/Day in 2017 which is low comparatively compared to the previous years. In the year 2003 it imported the highest amount of oil recorded at 1,726,000.³⁵

Graph 7: Saudi Arabia's main crude oil importers



(<https://www.cia.gov/library/publications/the-world-factbook/fields/2050.html#sa>)

4.4 Oil production

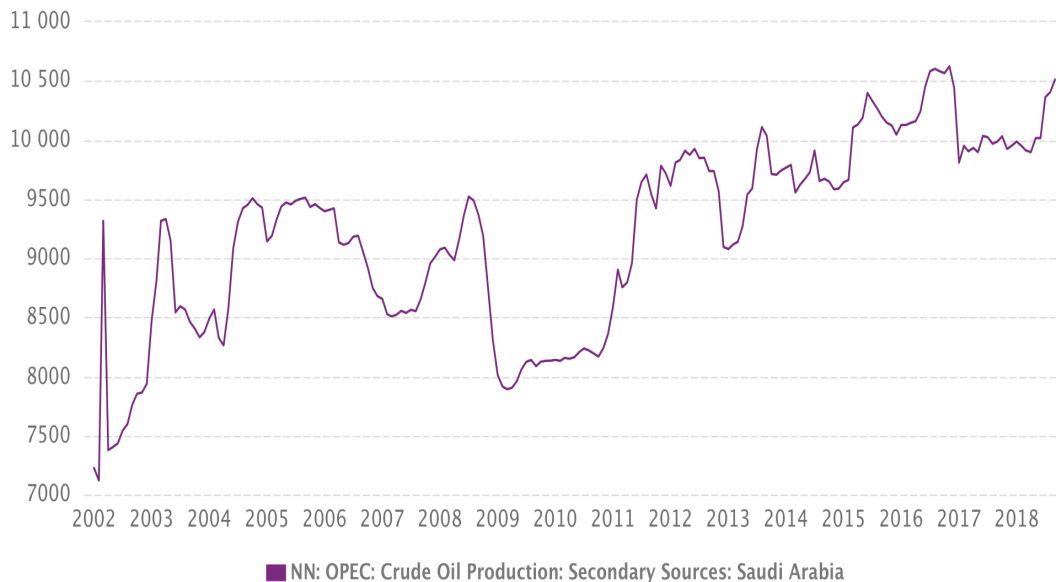
Saudi Arabia's economy is based on the vast production of oil. It is the second largest oil producer in the world, the co-founder and a leader to OPEC's production quota decisions, it is for sure the most active member of the organization, and the second largest country with proven oil reserve in the world. Amongst the other member of the organization, Saudi Arabia was estimated to produce up to 30 % of its production in the organization, surpassing the other members and about 13 % of its oil production counts for the total world production. The country has an output of almost 9.5 million Barrel/Day and it only consumes 2 million Barrel/Day for its petrochemical.

³⁵ <https://www.statista.com/statistics/487478/us-crude-oil-imports-per-day-from-saudi-arabia/>

The majority of the oil production is controlled by Saudi Aramco, which is itself is controlled by Saudi Arabia's Ministry of Petroleum and Mineral Resources and the Supreme Council for Petroleum and Minerals. Most of the production comes from Ghawar, the largest oil field in the country and in the world. The field estimates for almost half of the country's oil production. Crude oil that is produced there is generally a mix of heavy to medium sour oil, that is generally relatively high in sulfur and yields a fair amount of residual fuel and vacuum gasoil.³⁶

According to CEIC data, Saudi Arabia oil production was estimated at 10,420.000 Barrel/Day in June of 2018 in comparison with the estimation in May 2018 which was recorded at 10,015.000 Barrel/Day. The averaging production of oil in the country was estimated to be around 9,383.500 Barrel/Day between the year 2002 and 2018. The highest production was recorded at 10,625.000 Barrel/Day in the year 2016 and had its lowest in February 2002 which reached to 7,121.000 Barrel/Day as well all year 1985, it was recorded low of 2340 Barrel/Day.³⁷

Graph 8: Saudi Arabia's crude oil production



(<https://www.ceicdata.com/en/indicator/saudi-arabia/crude-oil-production>)

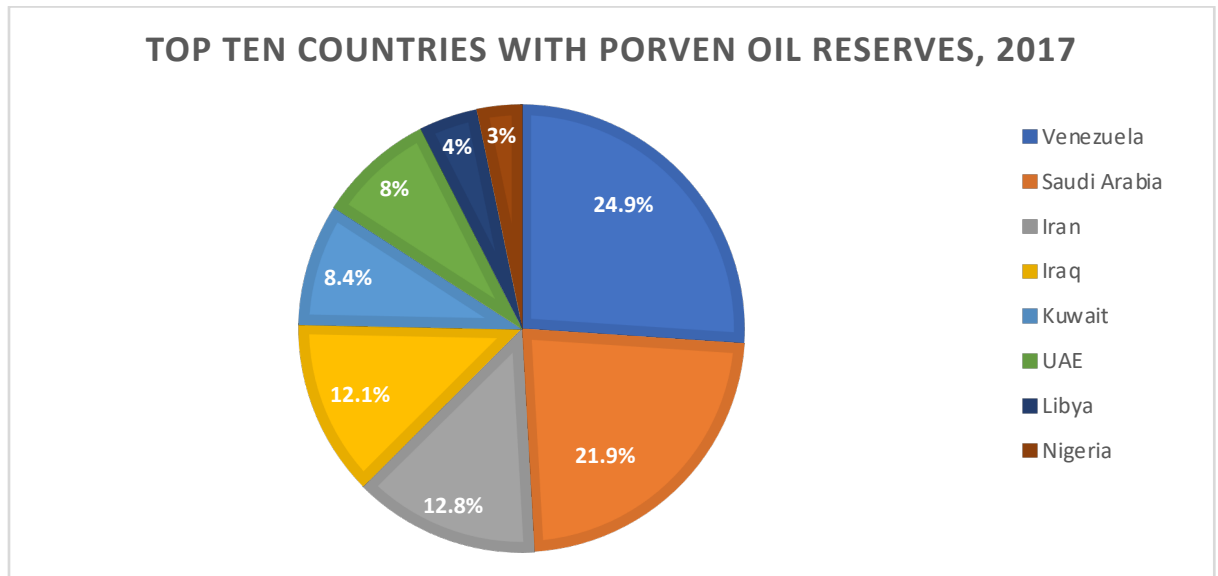
³⁶ <https://www.eia.gov/beta/international/analysis.php?iso=SAU>

³⁷ <https://www.ceicdata.com/en/indicator/saudi-arabia/crude-oil-production>

4.4.1 Oil reserve

Saudi Arabia is the second largest country in the world with proven oil reserves possessing about 21 % of the world total oil reserve estimated at 266.2 Billion Barrel in 2017 according to the statistics of OPEC. Ever since the 1990 until 2017 the estimation for oil reserves remained constant between 250 to 265 Billion Barrel. However, Venezuela as one of the fourteenth member of OPEC, surpasses Saudi Arabia with its proven oil reserves by nearly 3 %. It possesses about 300.9 Billion Barrel which is 24% of the world's total conventional reserves in 2017 according to the official website of OPEC.³⁸

Figure 3: Top ten countries with oil reserve, 2017



(https://www.opec.org/opec_web/en/data_graphs/330.htm)

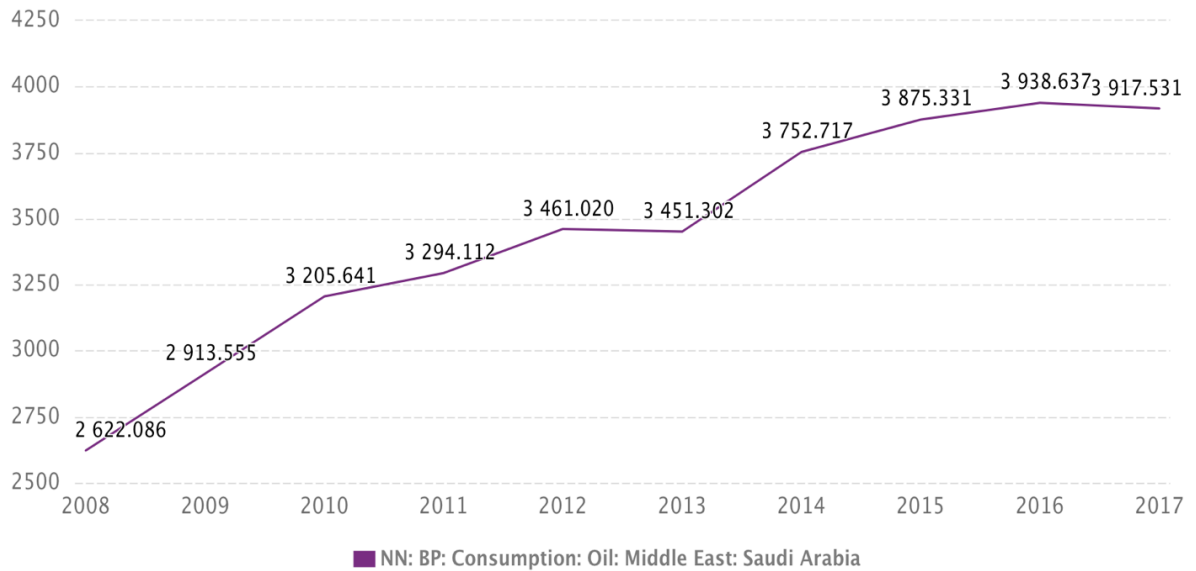
4.4.2 Oil consumption

Saudi has output of almost 9.5 million Barrel/Day and it only consumes 2 million Barrel/Day for its petrochemical. According to CEIC data, in December 2016, Saudi Arabia consumed 3,938.637 Million Barrels/Day. The consumption of oil grew by 7% per year on average between 2006 and 2016, all due to the result of strong economic growth and government-subsidized energy prices. The consumption of oil in Saudi Arabia was recorded at 3,917.531 Million Barrel/Day in December 2017 which was a decrease compared with the previous year. the consumption averaged at 1,155.414 Million

³⁸ https://www.opec.org/opec_web/en/data_graphs/330.htm

Barrel/Day from December 1965 until 2017. It reached its highest in the year of 2016 and its lowest in year 1965 recorded at 389.574 Barrel/Day.³⁹

Graph 9: Saudi Arabia's oil consumption



(<https://www.ceicdata.com/en/indicator/saudi-arabia/oil-consumption>)

4.5 Oil fields in Saudi Arabia

Saudi Arabia possesses five major oil fields, all located in different area and each operated by Saudi Aramco. However, the main three oilfields are:

Al Ghawar, which is the largest oilfield located in Al-Ahsa in the eastern province (south of Dhahran and west of Al-Hufuf). It is one of the largest conventional oil fields by both oil reserves and production in the world. The Al Ghawar oilfield produces about 5,000,000 million Barrel/Day of oil and 71,000 million Barrel/Day of oil reserve and it is estimated that it accounts for 6% of the total oil output in the world. It produces Arab Light Crude oil grade.⁴⁰

The second oilfield in the country is Safaniya located in the north of Dhahran in the Persian Gulf and produces 1,200,000 million Barrel/Day of oil and about 37,000 million

³⁹ <https://www.ceicdata.com/en/indicator/saudi-arabia/oil-consumption>

⁴⁰ <https://www.worldlistmania.com/list-of-oil-fields-in-saudi-arabia/>

Barrel/Day of oil reserve. It is considered to be the largest offshore oilfield in the world and it produces Heavy Arab crude oil grade.⁴⁰

Lastly, Shaybah. Shaybah is located in the north of Rub' Al-Khali and boarded south to Abu Dhabi. It produces about 1,000,000 million Barrel/Day and 14,000 Barrel/Day of oil reserve produces Arab Extra Light crude oil grade.⁴⁰

In the picture below, it demonstrates the location of the oilfields in Saudi Arabia. Number One is Al Ghawar, number two is Safaniya and number three is Shaybah.

Figure 4: Saudi Arabia's main oilfields



(<https://cla.auburn.edu/ces/energy/case-study-saudi-arabia/>)

4.5.1 Major ports of Saudi Arabia's crude oil

Saudi Arabia total export and capacity loading all together is estimated about 13 Million Barrel/Day. The capacity generally comes from four primary oil export terminals:

The primary Kingdom's export terminal is Ras Tanura located in the Persian Gulf. The facility of Ras Tanura is known to be the largest offshore oil exporting port in the world

with capacity of 6 Million Barrel/Day. Nonetheless, the crude oil grade of Saudi Arabia along with condensate and products are all located in this facility. The port includes three terminals they are: *Ras Tanura terminal, Ju'aymah crude terminal, and Ju'aymah LPG export terminal.*⁴¹

The terminal of Ras Tanura, is considered to be the largest terminal at the port of Ras Tanura having an average handling crude oil capacity of 3.4 Million Barrel/Day as well as 33 Million Barrel storage capacity. The terminal can contain tankers up to 500,000 deadweight tons (dwt). Saudi Arabia's crude oil grades are all loaded at the Ras Tanura terminal.⁴¹

The second terminal is The Ras al-Ju'aymah. The terminal has an average handling crude oil capacity of about 3.12 Million Barrel/Day. This terminal can accommodate some of the largest tankers up to 700,000 deadweight tons (dwt) for crude loadings. The crude oil grades of Saudi Arabia are all loaded at this terminal, alongside with bunker fuel with a maximum loading capacity of 120,000 b/d.⁴¹

The third terminal is The Yanbu King Fahd terminal on the Red Sea which the rest of the remaining volumes are exported. The terminal has a loading capacity of 6.6 Million Barrel/Day, it includes seven loading moors and can contain tankers up to 500,000 deadweight tons (dwt). The terminal holds a storage capacity of crude oil at 12.5 million barrels and the only crude oil grade that is loaded at the Yanbu terminal is Arab Light in comparison with the other terminals.⁴¹

Apart from these primary export ports, there are several minor ports that Saudi Arabia exports from, such as *Ras al-Khafji, Jubail, Jizan, and Jeddah*. Nonetheless the Saudi Aramco decided to start exporting from Muajjiz oil terminal on the Red Sea sometime before the end of 2017, which by that, it would raise Saudi Arabia's total loading and export capacity to about 15 Million Barrel/Day.⁴¹

The Figure below, shows the location of the major exporting ports in Saudi Arabia.

⁴¹ <https://www.eia.gov/beta/international/analysis.php?iso=SAU>

Figure 5: Saudi Arabia's major oil ports for exports

Figure 6. Saudi Arabia major oil and natural gas infrastructure
Saudi Arabia major oil and natural gas infrastructure



Source: U.S. Energy Information Administration, IHS EDIN

(<https://www.eia.gov/beta/international/analysis.php?iso=SAU>)

4.6 The effects of oil fluctuation on the economy of Saudi Arabia

Saudi Arabia has been one of the major countries that were economically affected by the fluctuation of oil price, both high or low throughout the years. This makes countries with a diversified economic structure which rely on oil revenues are mainly subject to a state of instability in their fiscal policy due to fluctuation in oil price. Regardless to the instability of oil prices, Saudi Arabia's only struggle is to maintain its market share and prevent oil producers from raising their outputs in the oil market.⁴²

Throughout several years, oil prices have been gone through several fluctuations and instability, causing a crisis in the oil markets, threatening the economies of oil-producing countries, even if it is only to a small extent. These changes are known as oil shocks that have had major impact on Saudi Arabia's economic growth.⁴³

⁴² <https://www.netotrade.ae/learn/trading-academy/forex-trading-basics/what-effect-the-fuel-rates-will-have-on-saudi-economy>

⁴³ <https://hbrarabic.com/ابحـث-علمي-تقلبات-أسعار-النفـطوالإنفاق-ا/>

First oil shock happened between the years 1973 and 1974. Between the year 1960-1970 the oil prices were almost stabled averaging at \$16.5 USD per barrel, and in the year 1973, the prices have started to increase due to the October war (Yom Kippur War) between Egypt and Israel. After 1974, oil price started to dramatically increase, reaching to about \$11USD per barrel. The result of the increase of oil prices led to an economical gain for the oil exporting countries and the opposite to the developing and industrialized countries, which were affected negatively. Saudi Arabia had benefited from the rise in oil prices since it is a major exporter of oil. This led to an increase in oil revenues from SR13.5 (\$3.6 USD) in the year 1972 to SR94.2 (\$25.1 USD). The contribution of the oil sector amounted at 94% of the total revenues of the state.⁴³

The second shock was from 1979 until 1981. This shock was considered to be a dramatic jump in the increase of oil prices because of the Islamic revolution happened in 1979, which led to the destruction of the Iranian oil sector. That resulted in cutting its oil exports to other countries, making oil prices increase to \$29.16 USD per barrel. In 1980, oil increased to \$35.52 USD per barrel due to the Iran-Iraq War that made Iraq's oil production decline. Because of the increase of the oil prices, oil revenues of Saudi Arabia reached to SR333.9 (\$88.9 USD), making the country's GDP grew to about 11.5%. However, during the 1986, oil prices fell sharply because of a non-agreement among the OPEC members states, therefore, Saudi Arabia had announced that it will protect its market share amongst the other OPEC producers. Saudi Arabia has made a vast cut on its oil and has increased its production significantly, which resulted in flooding the market to regain its share. This decision had an impact making the other members start implementing the same process giving massive discounts, and ended in declining the oil price.⁴³

The third oil shock was around 1990/1991. This shock was the result of the Iraqi invasion to Kuwait (the Gulf War), where oil prices rose from \$17.31 USD in 1989 to \$22.26 US per barrel in 1990, leading to the return of oil revenues to rise once more after a continuous decrease in revenues as a result of a decline in oil prices since the end of the eighties era. The GDP of Saudi Arabia had grown by 9.1% to 12.3% in 1990 and 1991. Throughout the 1990's, oil prices continued to fluctuate until the oil prices collapsed in 1998, where the price of oil reached to \$12.28 USD per barrel of OPEC crude oil as a result of the conflict in the market share of producing countries and the drop of the global

demand for oil and following the financial crisis that hit the economy of South Asian countries.⁴³

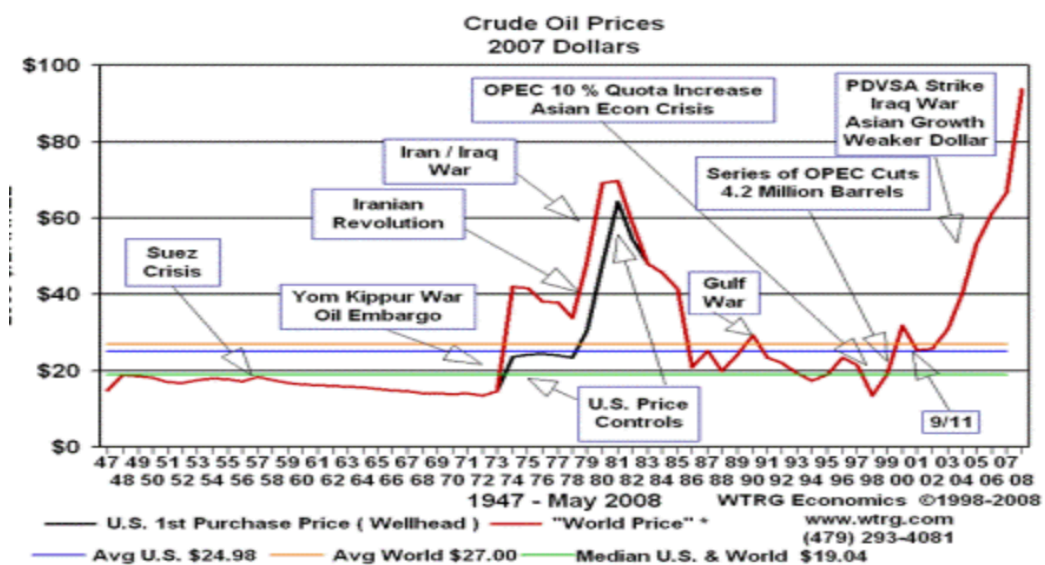
Fourth shock happened around 1999 and 2000. The economic crisis that occurred in the Southern Asian countries, in the year 1998, led to a sharp decrease in the oil prices reaching to \$12.28 USD per barrel, however, oil prices began to rise once more at the end of 1999 because of the reduction of OPEC's oil production and increase in demand for oil at the same time of the global economic flourishing. In 2000, the price of oil reached to \$27.6 USD per barrel. Saudi Arabia's oil revenues had been influenced significantly because of the increase of prices throughout these several years, the revenues reached to 168.03% in comparison to the previous year.⁴³

The last oil shock occurred in the year of 2002. In 2001, there was a drop in the oil prices that reached to \$23.12 USD barrel after the event of eleventh of September, causing a decrease on the global demand of oil. Due to this event and other political events, the Saudi total oil revenues accounted for 87% of the total revenues. From 2002 to 2008, oil prices have witnessed a significant increase and development, where in 2002 the price of the barrel reached \$24.36 USD continuing to rise until it reached a large increase reaching to \$94.1 USD barrel which that being said, the total oil revenues in Saudi Arabia reached to about 37 SR Million (\$98.64 USD). However, because of the financial crisis in 2008, oil prices had significantly decreased in the following year to \$60.86 USD barrel that led to a decline in the demand of oil. The following four years, the prices of oil were in their best position because the economy situation was stable at those times. The price of oil barrel had reached its peak in 2012 when it reached to \$109.45 USD. Nonetheless, after 2014, the oil prices have dramatically fallen, losing almost two-thirds of their value reaching its bottom rock in 2016, where the price of the barrel reached to \$40.68 USD. This 2014 oil crisis occurred because of several factors such as the blooming oil industry and the production in the United States of America and keeping Saudi Arabia's oil production at a low rate.⁴³

The decline on oil prices has had negative impacts on Saudi Arabia's overall economic growth, even if it is only to a small extent. For instance, the decrease of oil prices will drop the oil revenues, and decline in government spending causing the economy growth to

slow down, apart from that, this will also impact negatively on the foreign investment income sector in the country, the country's GDP, exports net, will generate trade balance surplus and public budget. However, Saudi Arabia has and will benefit from higher prices. It allows the country to pump more investment into the oil and other sectors, improving its economic environment allowing more support to the private sector's potential. It also had a positive impact on the GDP, government spending.⁴³

Graph 10: Historical oil Fluctuation affecting Saudi Arabia's economy



(<http://www.economywatch.com/world-industries/oil/historical-prices.html>)

4.7 Impact of OPEC to Saudi Arabia

The Organization of Petroleum Exporting Countries (OPEC) is normally described as Cartel, which is inter-governmental organization. However, according to OPEC, it defines itself as an international organization that was formed by countries with economy largely depending on oil revenues. The main purpose of the organization is to maintain the stability of the oil supply and prices in the market by controlling the level of production and to generate oil revenues. Based on the understanding of what OPEC's main goal is, it also has other goals in regards to benefit and influence the development needs of its members. (Rodney Wilson with Abdullah Al-Salamah, 2004)

According to scholars, they have diversified the OPEC's members into two categories, major and minor countries. The countries which have a large population and lesser oil reserve are the minor members of OPEC, whereas the countries which have fewer population density and more oil reserve are the major member. One great example of the major member is Saudi Arabia.⁴⁴

Saudi Arabia is one of the major members that benefits from OPEC since it is the leader and considers to be an active member. The influence of OPEC to Saudi Arabia's economy is great, since it derives a huge share of GDP from oil exports and in return the gain from oil sector accounts for almost 90% of the government revenues. OPEC has benefited Saudi Arabia in many ways, since the oil sector dominates the economy of the country and the income from non-oil source remains low. One of the benefits that Saudi Arabia gains from OPEC is identified from the main purpose of the organization which concerns securing the countries fair share of its oil resources in order to quicken the economic development and to improve the welfare to its people. Another benefits, can be identified as a non-economic benefit, is that OPEC safeguards the countries interest within the oil market after all, this is the main purpose of the organization to maintain and protect its members oil share within the oil market. This will give an opportunity for the country to influence on the Western countries since most of them are depending on OPEC's oil as well as having a key role in the world's oil market.⁴⁴

4.7.1 Impact of OPEC on oil prices

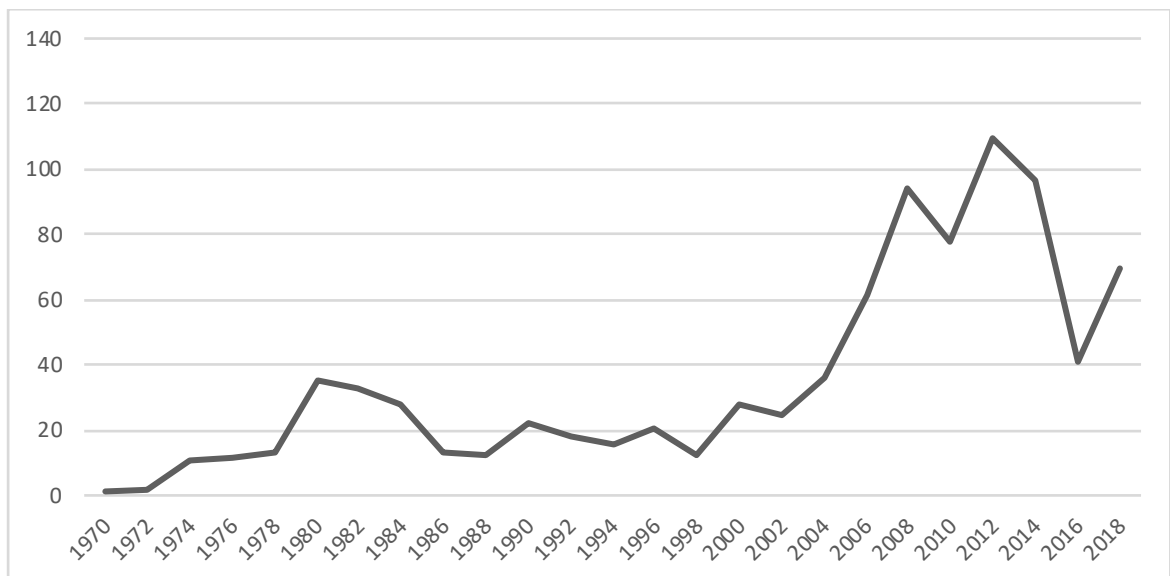
OPEC plays a major role in manipulating oil prices in the oil market and its potential in affecting the supply and demand balance is very important. Since OPEC accounts for more than 80% of the world reserve oil in 2017 and most of its of its oil production comes from the Middle Eastern countries roughly around 65%. And because the organization's nations have a high level of reserve and production. It should be mentioned that the organization had set quotas for its members that help to control the oil prices as well as to maintain the ceiling required for oil production. The reason why OPEC uses the tool of quota in oil production is to provide balance and sustainability in the market. the organization

⁴⁴ <http://www.sciedu.ca/journal/index.php/rwe/article/view/120/81>

emphasizes the importance of supply and demand in the oil market, so if there is a large supply of goods then the price of oil drops whereas if there is a large demand then the oil price increases among its members when performing under the quotas. Due to the rule of supply and demand as well as quotas that are settled by OPEC, the member countries with a large oil production, Saudi Arabia for instance, have an opportunity to make large benefit out of these quotas. Although the members might exceed on their oil production going above the actual quotas that is set so that they can gain more benefits.⁴⁵

Throughout the years, oil prices have gone under many fluctuations where many countries have been affected by these dramatic changes. OPEC does not only balance the oil market but moreover, it has a great affect to drive the oil prices up and down within the global market these periods are the ones that are mentioned in the previous chapters such as the price shock around the later 1980's, the Asian economic crisis in the 1990's, the financial crisis in late 2008 and lastly when OPEC interfered in the over production of oil in 2014 which led to a dramatic drop as seen in the graph below. ⁴⁵

Graph 11: Impact of OPEC on oil prices



(<https://www.statista.com/statistics/262858/change-in-opec-crude-oil-prices-since-1960/>)

⁴⁵ https://www.spe.org/en/print-article/?art=2789&fbclid=IwAR05yBfv8cMLZVcwSBCjRYPHpDZfAmbgG1yZsp8MzjWd2_a-7WwhMHhashY

And because of these events that occurred in the fluctuation of prices and the influence of OPEC in them, in the year 2016 OPEC member countries and their major allies such as Russia have made an agreement in reducing the amount of production by 1.2 Barrel/Day for the first six months of 2019. The members have started to reduce their production by 800,000 Barrel/day while Russia and others by 400,000 Barrel/Day in order to gain balance and stable prices in the market.⁴⁶

4.8 Vision 2030

For years, Saudi Arabia has always depended on the oil revenues for the purpose of flourishing its economy. The oil production and exporting play a very important role to the country since the oil revenues accounts for about 80% of the country's government revenues. As mentioned now in the previous chapters that Saudi Arabia the fluctuation of oil prices has impacted on the economy of Saudi Arabia very much from rising and decreasing. When the prices increase, the county benefits from pumping more on the investments the GDP rises and so one, but when prices decreased that will lead to lowing the GDP rate and the country will counter some loses even if it can survive under the reduction of prices. Ever since 2014 when price have deteriorated and many countries were affected by and Saudi Arabia has decreased in its oil production to maintain its share in the market, it led the country to go on a major fascial deficit of 16% of its GDP in 2015. With that being said, the government of Saudi Arabia has feared of the dramatic changes of the oil prices and how will that affect their economy on the future. that is why the kingdom had decided to reduces its oil dependency on its economy by announcing their new scheme of "Vision 2030".

Saudi Arabia has astonished the world with their mega project "Vision 2030" that was announced in April 2016 created by the crown price Mohammed Bin Salman aiming to reform Saudi Arabia's economy structure and its society. The crown price had stated his goals for this remarkable vision is for his country to hold an important role in the Islamic and the Arab world, the determination to become a global investment center as well as

⁴⁶ <https://www.cnbc.com/2018/12/07/opec-meeting-saudi-arabia-and-russia-look-to-impose-production-cuts.html>

transform the country's strategic location into a logistic hub connecting between Asia, Africa and Europe.⁴⁷

The vision has great expectation in the future of Saudi Arabia. The Vision seeks to change many aspects in the country economically and financially, for instance it wants to change its economic position from being the 19th to top 15th in the world, the increase of private sector will contribute from 40% to 65% of the GDP, foreign direct investment will also increase to the international level from 3.8% to 5.7% of the GDP, it also aims to lower the rate of unemployment from 11.6% to about 7% and last but not least the country will depend less on oil export and there will be a rise of non-oil goods and services from 16% to 50% of the GDP.⁴⁷

According to the studies, even if oil prices have been stabled or rose the country will not pay attention to that since the goal for the vision to reduce the historical dependency on oil revenues so that they can focus on the other parts of different sectors. With that being said it is expected that a new diverse society to arise in being highly educated and strong human capital investment will be all contributed with the new economic development. As shown in the figure below, the oil revenues will decline by the year of 2030 and they will focus more on other sources for their government revenues and exports.⁴⁸

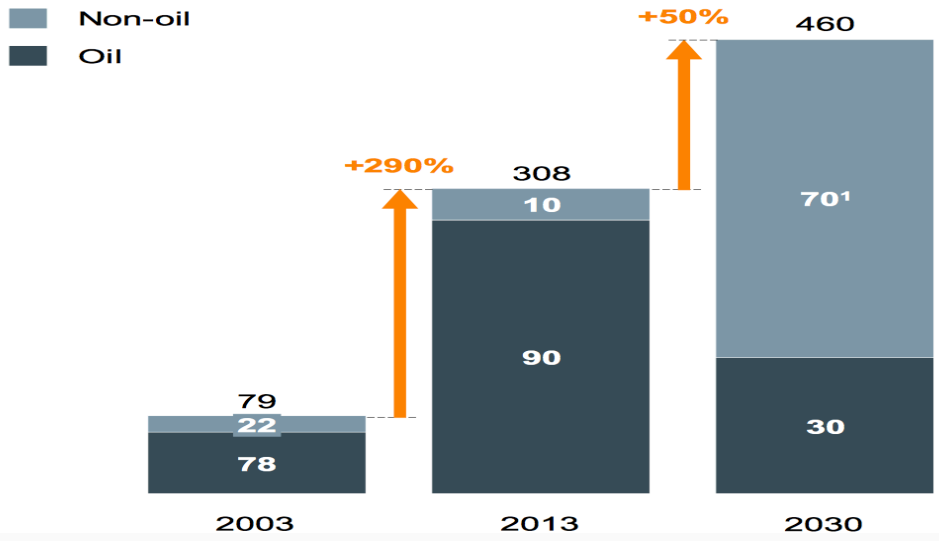
⁴⁷ <https://vision2030.gov.sa/en>

⁴⁸

https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Employment%20and%20Growth/Moving%20Saudi%20Arabias%20economy%20beyond%20oil/MGI%20Saudi%20Arabia_Executive%20summary_December%202015.ashx

Graph 12: Oil production in 2030

Government revenue by source, 2003–30
%; \$ billion, current prices



(https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Employment%20and%20Growth/Moving%20Saudi%20Arabias%20economy%20beyond%20oil/MGI%20Saudi%20Arabia_Executive%20summary_December%202015.ashx)

5 Conclusion

Energy sector plays a huge role in any country's economic development preconditioned by the fact that every country requires energy resources for its economic fields to function & to satisfy basic human needs. Even though renewable sources of energy are becoming trending in this present day to prevent the harm being done to the environment innovate to an alternative source which also is cost effective. However, most of world's energy sources are still traditional. Among which oil is playing the biggest role as an energy resource which is predefined by effective technology for oil exploration and availability. Crude oil being a natural resource is present in different quantities in various countries and not present at all in most of the countries around the world.

Depending the quantity present naturally in a country gives them different level of abilities to satisfy their own country need for energy resource and export their energy resource to other countries. Saudi Arabia has second largest reserves of naturally occurring oil in the world after Venezuela and is the leading exporter of oil in the world. Some sources claim that over one-eighth of the world daily oil consumption is produced by Saudi Arabia. Saudi Arabia is also a member of OPEC an organization that holds reigns to majority of the global oil market subsequently making Saudi Arabia a major player in the oil market.

We can conduct that the fluctuation on the oil prices have a major impact on the economy of Saudi Arabia. Increasing in the prices will affect positively on the performance of Saudi Arabia's economy. Other facts determine the stability and the increase of the overall economy such as the political situation that occurred throughout the years. However, future trends of how the oil market will develop in the upcoming years is preconditioned on large number of factors some major ones are a country's ability to accomplish its geopolitical goals, alternative source of energy, competition in oil producers, OPEC policies etc. Saudi Arabia understands that even though oil is the biggest source of energy now and developing countries depend on it to pace their economic growth for example China heavily depends on oil as an energy source. Saudi Arabia does not wish to base their entire economy around oil as they have done it the past hence the project "Vision 2030" was initiated. In vision 2030 Saudi Arabia looks to have only 20% of their annual GDP based on oil and wish to transition to a more diverse form of economy.

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