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The impacts of sanctions and the opportunities for
crude oil market after sanctions lifted:
The case of Iran

by

Minh Trang Nguyen

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Abstract

The long history of sanctions imposing against Iran is perhaps the most experience hardship ever by the international community. Under the complex punishment, Iran was isolated from the world and not only its economy was damaged but also the crucial industry of Iran – crude oil – was suffered. Howbeit, the actions about easing sanctions from the US and the EU in the beginning of 2016 might open a new fortune for Iran's crude oil sector.

The basis of this research is to comprehending and analysing the Iranian and global crude oil market consisting of the background about oil market itself, main players and trends which have been distinguished in the industry. By doing that, we estimate and analyse crude oil's potential aspects, that were struck during the embargoes and based on the interviews conducted with 10 interviewees and two case studies about similar issue in Libya and Russia. According to the result, due to the international sanctions, Iran's crude oil production was interrupted and Iranian buyers could reduce their purchases for its oil. Furthermore, crude oil reserves and storage together with crude transportation also experienced numerous fluctuations. This situation in Iran even though did not crippled global oil production, it would hurt world oil prices. In case of sanctions' removal, Iran could return to the international oil market by boosting export and producing more crude. Additionally, Iran could gain more attention from foreign investors after lifting of sanctions. Although a project from four researchers predicted that Iran will continue to increase its production, we believe that the country still has a long way to reach the pre-sanctions level and hard to be a long-term player with price influence in crude oil market.

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List of Abbreviation

APOC	Anglo-Iranian Oil Company
Bpd	Barrel per day
CIF	Cost, Insurance and Freight
CISADA	Comprehensive Iran Sanctions, Accountability and Divestment Act
EIA	Energy Information Administration
EOR/IOR	Enhanced Oil Recovery/Improved Oil Recovery
EU	European
FOB	Free On Board
IAEA	International Atomic Energy Agency
IEEPA	International Emergency Economic Powers Act
IOC	International Oil Company
IPC	Iran Petroleum Contract
IRISL	Islamic Republic of Iran Shipping Line
ISDCA	International Security and Development Cooperation Act
JCPOA	Joint Comprehensive Plan of Action
JCPOA	Joint Comprehensive Program of Action
LNG	Liquefied Natural Gas
NIOC	National Iranian Oil Company
NIORDC	National Iranian Oil, Refinery and Distribution Company
NITC	National Iranian Tanker Company
NOC	National Oil Company
NPC	National Petrochemical Company

OPEC	Organisation of Petroleum Exporting Company
PGPIC	Persian Gulf Petrochemical Industry Co
POC	Private-owned Oil Company
UAE	United Arab Emirates
UN	United Nation
UNSC	United Nation Security Council
US	the United States
VLCC	Very Large Crude Carrier

Chapter 1 Introduction

1.1. Background

Over the past decades, the patchwork of embargoes imposed against Iran is the most influential event to not only Iranian economy but also the lives of Iranian. Implemented by different countries with different firms using various tools, sanctions played a crucial role in persuading Iran to accept the initial restrictions on the nuclear program. The first penalty series first started by the United States during the US – Iran hostage crisis of 1979 – 1981 (Katzman, 2017). Over the years, the US Government has proceeded other sanctions towards Iran. Also, the United Nation, the European Union, and some countries also enabled sanctions on Iran. In 2012, to put pressure on the economy to change Iranian nuclear policy, the new round of sanctions was added. These additional restrictions have been known as an unprecedented level. In fact, sanctions imposed on Iran's finance, individuals or organisations involving in nuclear proliferation activities. Nevertheless, Iranian oil sector especially was targeted by a coordination between the US and the EU. More importantly, this event was the first-time European members jointly introduced the punishment on Iran's crude oil exports, which only went through the US sanctions before.

For a long period, Middle East has known as a strategic region for trading in oil. Being a part of Middle East, Iran is attractive by natural resources and also in the crude oil business. In 1908, Iran became the first country in the Persian Gulf discovering oil, and over the last century, Iran has been one of the world's largest oil producers (Kent, 2015) and holds the fourth-largest proven oil reserves in the world. In addition, Iran is also a member of OPEC and has been ranked in top five producers for many years. Hence, the oil sector has become an engine of the economic growth in Iran. Indeed, over the past few years, oil contributed on Iranian government revenues approximately 60 percent and accounted 10 percent of the gross domestic product. However, as previously mentioned, the background of Iran's crude oil industry witnessed a downward trend after becoming a sanctioned target. Thus, the global oil markets began to feel the impact on the oil price itself.

In January 2016, the agreement on the lifting of sanctions from the US and the EU was ratified in return for Iranian nuclear program deceleration. When the sanctions were removed, there has been a significant impact on Iran's crude oil sector and have resulted in a notable effect on global oil markets.

1.2. Research Objective

The main purpose of this thesis is to outline the oil-related sanctions on Iran, evaluate their effects to explore the fluctuation in global and Iranian oil market under sanctions, and discuss the influence on Iranian oil industry when sanctions were lifted. The thesis will also mention to what extent oil sector in Iran can be taken opportunities after sanctions removed.

Based on the core objective of this research, the main research questions are formulated as follows:

“What is the influence of the introduction and lifting of the sanctions against Iran on the Iranian and global oil markets?”

The principal idea behind this research question is that the ending of sanctions against Iran will cause a perceptible shift within Iran's petrochemical. With this change, new opportunities for the core industry in Iran will be opened.

In order to give a depth comprehension to reach our desired outcomes and answered main research question, we also need to deal with the following sub-research questions:

1. What are the main embargoes imposed on Iran and what are they about?
2. How does the Iranian oil sector take the opportunities after sanctions lifted (in terms of the growth in oil production, export,...)?
3. Can will Iran recover its position on the global oil market once sanctions were eased?

1.3 Thesis structure

In an effort to answer the research questions, this thesis begins by considering an overview of the sanctions history imposed on Iran such as the United Nation, the European, the United States and different national sanctions against Iran. Following these footnotes, a discussion of the sanctions lifted levied by preceding organisations or countries is also mentioned.

Chapter 2 describes a theoretical overview of previous studies about Iranian sanctions and takes a closer view on the history of Iran's oil. Besides, the repeal of sanctions and remain sanctions will also be mentioned.

Chapter 3 details on the methodology which is applied to complete this research.

The results from interviews will be mentioned in chapter 4. In addition, the descriptions of two case studies from Libya and Russia are included in this chapter.

Chapter 5 attempts to answer the main research questions ***“What is the influence of the introduction and lifting of the sanctions against Iran on the Iranian and global oil markets?”***. In this chapter, an analysis will be carried on and then it will give an interpretation of the results.

Finally, chapter 6 will summarise the main findings is the based on the results of this research, the limitations through the time conducting the research and recommend suggestions for the further future research.

Chapter 2 Theoretical framework

Compared to the other scopes of sanctions' effects on the economy, the studies in areas of oil industry's impacts are scant. There are not many specific research discussing the theoretical overview of this topic. Nevertheless, certain of studies analysed about the definition of economic sanctions, the logic behind them or Iran's oil economy. Some of those researches are reviews as follows.

2.1 International economics of sanctions

In order to analyse economic sanctions, it is undeniable that establishing the factors which constitute economic sanctions is important and necessary. Different researchers have different views and ways to define economic sanctions. Carter (1988) mentioned that economic punishments, which guarantee the political purposes completed and change the policies of government to create binding sanctions, are a coercion's form for one or more nations. While, a group of three scholars, Hufbauer, Schott and Elliott (1990) considered economic sanctions are the limitation on normal commercial or financial relations among the nations.

Davidsson (2011) shows that the economic limitation on cooperation between trade and financial transactions or both aspects can weaken life circle of the economy in some countries. A successful sanctions regime will be estimated when they imposed on the target countries at higher costs or a threat toward their potential.

According to Majidi and Zarouni (2016), sanctions have existed for a long history, but the use of sanctions has been noticed frequently after World War II. They emphasized that economic sanctions are a structure of political force in order to replace the utilize of the military. In this research paper, they also explained that the economic trade's relations with external conditions are the most apparent characteristic of economic sanctions in trade restrictions. These limitations can be sales of products or technology's aspects of production, these harsh conditions need to exchange with the business co-worker, and the transactions cannot be communicated with Central Bank. Beside to unilateral punishment implemented on Iran, a consideration from the multilateral sanctions, and US and UN restrictions should be examined. However, the effects of the US and EU sanctions are widespread explosively in all the main areas of Iran's economy. They even put burdens on the other countries' government in order to enforce these nations join their unilateral sanctions. In the case of the global agreement or agreement-binding neighbours impose an official ban on the country to follow international punishment, the country will be subjected to high prices and the lack of commodities and services. In addition to trade exchange, economic restriction of US and EU have also adopted financial correlation. In alignment with this, time and energy for changing the business and financial rituals are the first impacts of sanction. Another impact of sanctions is higher prices for similar goods which lead to a reduction of money's power and a loss in investment opportunities.

Economic restrictions are often applied on countries with undesirable behaviour which may be domestic or international. Moreover, the punishment can be implemented by a cooperation among nations or by individual countries. It is also noticed that sanctions do not always have negative impacts, they can also be positive namely sanctions relief (Ataev, 2013).

Regarding types of sanctions, there are various types of economic sanctions. Hufbauer et al (1990) highlighted that a country called "sender" will embargo sanctions

or threaten to its “target” countries by restricting export and import or impede financial operations. Specifically, export prohibitions are issued to deny access to “target” country’s crucial goods, while import restrictions are applied to decrease the exports of the target country and thus reduce income. Financial embargoes aim to hurt the target nation by rising cost of credit and by make transactions to be in trouble.

The success of a punishment project depends on several factors in common. For instance, the type of policy goal during the expiration of sanctions will measure the effectiveness of sanctions. Also, the breach of international sanctions is one of the firms used to evaluate the positive result of sanctions. Finally, the outcome of an economy or political issues from a target country can estimate sanctions’ effort (Hufbauer et al, 2007).

2.2 Iran’s economic sanctions

2.2.1 History of Iran’s oil sector

In order to have a noteworthy comprehension about Iranian oil market, it is important to understand the significance of long and fraught petroleum’s history in Iran. In 1908, oil was first discovered in the Southwestern province of Khuzestan in Iran. By the decade of “The Roaring Twenties¹”, the national oil sector had grown and Iranian government had constructed a tremendous refinery in Abadan on the Persian Gulf. Therefore, Iran became one of the top five oil producers in the world, contributing to 5% - 6% of world production (Brew, 2016).

However, the revenues earned from oil production was paid with only a small percentage to Iran because on 20 May 1914, the British government and Anglo-Iranian Oil Company (AIOC) signed an agreement in which the British firm would hold 51% of shares and became the main shareholder (Malek, 2017). Consequently, the revenues from oil were shared between two entities. This situation became an issue during the oil nationalization crisis within 1951 – 1953 which was implemented by Iranian Prime Minister Mohammed Mossadegh. Under the nationalization of Iran’s oil industry, the British technicians were expelled from Abadan and this event, thus, led to the worldwide oil crisis (Iran International, 2014).

In 1964, the National Iranian Oil Company (NIOC) was responsible for all of the activities including creation and development of petrochemical industry which resulted in National Petrochemical Industries Company (NPC)’s establishment. In the following year (1965), the law on the development of petrochemical sector was adopted (Iran International, 2014). After the 1973 oil crisis, the petroleum industry in Iran was developed and gained enormous profit from its oil production. In particular, the peak of production was in 1974 at 6 million bpd (Brew, 2016). Thenceforward, the Iranian government wanted to maintain a strong desire to develop its petrochemical field in order to cite it as a core industry. However, various events happened in modern history have led to Iran’s inability to fulfil its desire. The massive cash flow of oil – based wealth stabilized Iran’s economy, accelerated inflation, and exacerbated the depression of the mid – the 1970s. This situation also caused the repelling Shah Pahlavi in 1979 as well as the rise of the Islamic Republic, which led to the strike in Iranian oil industry and reduced Iran’s oil output to 2 million barrels per day (Bill, 1988). After Shah Pahlavi’s ousting and the Islamic Republic’s instatement, the Iran – Iraq

¹ 1920s was known as The Roaring Twenties of Western society and culture due to sustainable economic prosperity. See more information at:

<http://www.bbc.co.uk/schools/gcsebitesize/history/mwh/usa/1920srev1.shtml>

War broke out. Thus, the 1980s witnessed almost the stable trend of growth in petrochemical exports. Nevertheless, petrochemical infrastructure, research and development have been invested more from domestic and foreign investors after the end of the war. During this period, international oil markets had treated Iran's crude oil production in a similar way to the other crude oil production out of the Persian Gulf. Iran's customers contracted a specific amount of crude oil or bought it on the spot market; international shipping companies signed contracts with customers to transport crude oil from place of origin to destination, and maritime insurance agencies covered insurance for both ships and cargo.

Over the four – year period (1995 – 1999), there was a quintuple oil production from 2.4 million tons to 11 million tons due to the improvement on a series of petrochemical sites by NPC. Continuing into the 2000s, the Iranian petrochemical industry was impacted because of the increasing U.S sanctions and the implement of EU sanctions in 2010 as well as the other countries such as Japan, South Korea, and Australia.

2.2.2 Management of Iran's oil sector

According to research by Daukoru (2011), oil sector initially was formed by private-owned oil companies (POCs) and reputable entrepreneurs. However, private oil producers dealt with the surplus supplies of crude oil in 1908, so the first National Oil Company (NOC) was set up. The establishment of state-controlled companies influenced significantly on the ownership shape of crude oil sector. Indeed, Pirog (2007) stated in his paper that the ten state-owned companies will be the main force in global oil market approximately seven times more than five international oil companies. Moreover, in the market with production and price power, the state oil companies play the dominant roles compared to the lesser power of international oil companies.

Following the footnotes, Iran has also shaped its oil sector as owned structure. Generally, the energy industry has been managed by the Supreme Energy Council, establishing in 2001 and overseen by the Iranian president. Concerning to the structure of Iran's petroleum, the High Council of Iran's petrochemical industry consists of Ministry of Petroleum. Under the management of the Ministry of Petroleum, the three main state-owned companies control the oil activities, accompanied by Iranian petrochemical sector. They are the National Iranian Oil Company (NIOC), the National Iranian Oil Refining and Distribution Company (NIRODC), and the National Petrochemical Company (NPC) (EIA, 2014). Figure 1 following represents the Iranian petrochemical industry's structure.

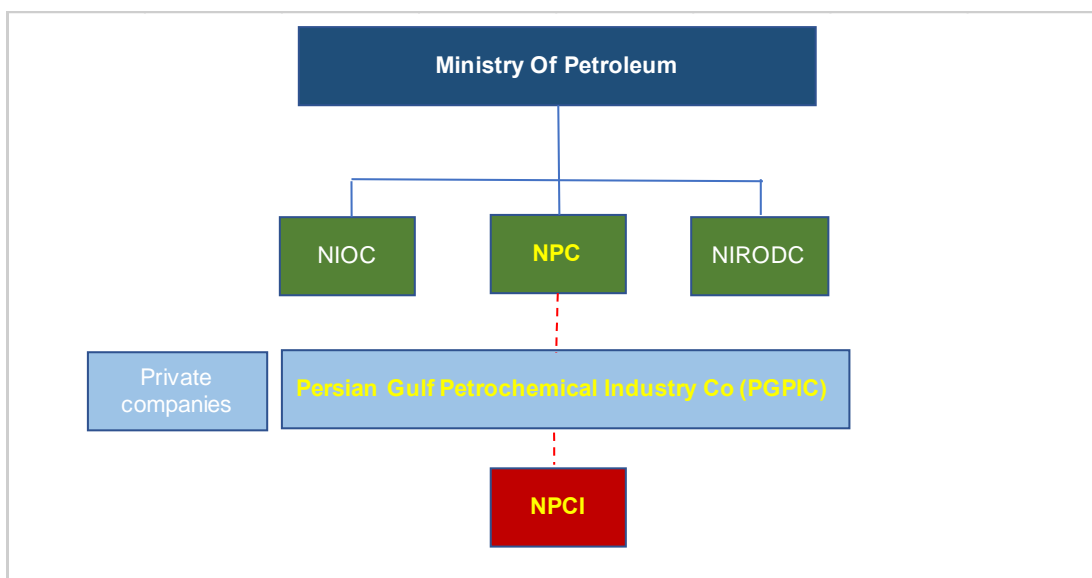


FIGURE 1. IRANIAN PETROCHEMICAL INDUSTRY'S STRUCTURE

Source: Persian Gulf Petrochemical Industries Co

Persian Gulf Petrochemical Industry Co is known as the largest holding company in Iran which was established in 2008, along with implication of the Constitution, Article 44² on the basis of Authorization No. 161681 (PGPIC, 2016). At present, NPC is the second largest shareholder of PGPIC with 20% of company's share.

TABLE 1. IRANIAN STATE-OWNED OIL COMPANIES

Company	Responsibility
National Iranian Oil Company (NIOC)	NIOC is a government-owned enterprise, a national producer, and distributor, which is ranked as the second largest oil company in the world. The company controls all of crude oil activities via its subsidiaries such as exploring, exploiting, shipping and exporting.
National Iranian Petrochemical Company (NPC)	NPC is chaired by the Ministry of Petroleum under the ownership of Iranian government. Today, NPC ranks the second level of Middle East's production and exports in the crude oil. The company is responsible for several petrochemical operation and development. Its main activities for many years are producing, trading, exporting and distributing petrochemicals.
National Iranian Oil Refining and Distribution Company (NIRODC)	NIRODC operates all activities relating to refining crude oil, distribution, exports, and transfer.

Source: NIOC, NPC, NIRODC

² Constitute Project (2017). *Iran (Islamic Republic of)'s Constitution of 1979 with Amendments through 1989*. pp.17.

2.2.3 Categories of sanctions

In this section, four categories of sanctions imposed on Iran are discussed such as Security Council of the UN, European Commission, US and the restriction from other nations. In particular, this section introduces their definitions, developments, breaches, and purposes.

2.2.3.1 UN Sanctions

The UN Security Council has progressively approved an international sanction on all its member states as a part of efforts to address Iranian nuclear program. Between 2006 and 2008, the primary resolutions were adopted (no. 1696, 1737, 1747 and 1803) which imposed on Iranian weapons of mass destruction. In June 2010, an additional resolution called UNSC Resolution 1929 of 2010 was applied, which mainly targeted in balancing the peaceful nature of the nuclear program in Iran. The latest version was Resolution 2231, implemented on 20 July 2015 when it was announced by the International Atomic Energy Agency through Joint Comprehensive Program of Action (JCPOA) that Iran had ameliorated its nuclear program.

Breach of sanctions

The UNSC Resolutions is mandatory to be introduced under Chapter VII of the UN Charter (The Swedish Club, 2011) and the terms must be obeyed by all countries who are the UN members. However, the sanctions regime does not have direct effects and must be achieved by national law.

Restrictions

The UNSC Resolutions 1696 requested that unless Iran terminates all enrichment and reprocessing activities, Iran would confront economic and diplomatic punishment. The UNSC Resolutions 1737 called to block import and export of Iran on nuclear material and equipment, the financial assets involving to Iran's nuclear activities, in addition, would be frozen. Moreover, all countries must prevent the provision or sale of equipment and technology that can support Iranian nuclear program. Following these Resolutions, the UNSC Resolution 1747 emphasised that all countries are required to consider carefully Iranian bank transactions. Besides, the resolution also demanded that if there are reasonable evidence to prove that the cargo planes or ships to/from Iran are carrying prohibited goods under the UN Resolution, all countries must take an action to check them.

The June 2010 Resolution expanded the prohibition to list of commodities, materials, and technologies which could be aided to support the nuclear development and other weapons of mass destruction. The major terms of this resolution which relates to shipping and trade sectors are described as following:

1. It allows countries to inspect any shipment suspected of being contraband and provide additional rights to the goods to be disposed of. The inspection at sea must be approved by the country where the vessel is registered.
2. It prohibits the sale to Iran of most heavy weapons and requires the control in light weapons' sale.
3. It requires states to emphasize that the companies registered there, are not allowed to do business with Iran if there is the reason that the business could continue Iran's programs on weapons of mass destruction.

2.2.3.2 European Sanctions

On 27 July 2010, the toughest sanction was imposed on Iran by the EU Foreign Affairs Council with regard to energy, insurance, transport and financial sectors. The Council Decision was based on the passing of UN Security Council Resolution 1929 by the

UN Security Council on 9 June 2010. This decision also followed the signing into law on 1 July 2010 of the Comprehensive Iran Sanctions, Accountability, and Divestment Act by President Barack Obama (Clyde & Co, 2010). Compared to the UN sanctions, the EU sanctions are appreciably broader and more coherent which concentrated on avoiding the sale and supply goods used in nuclear production and missile to Iran. The new EU sanctions targeted at energy, finance and transport, and entities related to Iranian Government.

Breach of sanctions

The regimes of EU sanctions on Iran applies:

1. On the EU territory, including airspace
2. On an aircraft or a ship under the jurisdiction of a Member State
3. To any person who is citizen of a Member State, inside or outside the EU
4. For any legal person, entity or agency established or constituted under the law of Member States
5. To any entity or agency in respect of any business carried out wholly or in part of the EU but the sanctions will be limited to that business and will not expand into business outside the EU.

The scope of this sanction will consist of owners, managers, operated charterers and vessels which are registered or cooperated.

The sanctions are not applicable to non – EU companies. However, if these companies, which are associated EU companies or have employees who are EU citizen, take any actions in the sphere of sanctions, may deal with penalties under EU regime.

Restrictions

(Re)Insurance

Since 2010, the European re(insurance) market has become acquainted with sanctions systems and has led to significant consequences for the business with Iran as well as Iranian entities. In particular, the restrictions under 2010 regulation were remarked as:

1. The restriction on accourting (re)insurance to the Iranian Government and Iranian entities.
2. The application of blockading an asset with regards to certain Iranian entities and individual designated.
3. The ban on transfer funds which is relevant to Iranian entities and individuals.

On 24 March 2012, the EU replaced 2010 EU regulation by 2012 EU Regulation, including the expansion of the previous regime in several crucial points. Indeed, the EU adjusted the ban on provision (re)insurance to Iranian Government and Iranian entities to involve the brokering of risks. Following the changes, a new prohibition of providing (re)insurance in accordance with crude oil, petroleum, and petrochemical products in Iran was also needed to be awarded by the (re)insurers and (re)insurance brokers belong to the EU.

- **Prohibition of provision on (re)insurance to the Iranian Government and Iranian entities**

According to Article 35 of the 2012 EU Regulation, EU requested the breaches for the ban of (re)insurance provision or brokering are:

1. Iran or Iranian Government, public companies, corporations, and agencies.
2. Iranian or entities are not natural people
3. Natural people or legal people, bodies, acting on behalf of the legal entity, organizations or agencies mentioned in (1) or (2).

Similar to the EU Regulation 2010, there are a number of reductions in these provisions regarding the provision or brokerage of:

1. (Re)insurance of the owner, aircraft or vehicle leased by one of the parties.
2. Policies for individuals (including residents in Iran) operating as private capacity (including health and travel insurance)
3. Compulsory liability insurance or third-party liability (re)insurance for persons, organizations and agencies depended on the EU (including insurance for Iranian diplomats or consular missions).

- **Prohibition of provision on (re)insurance to the crude oil, petroleum and petrochemical products**

On July 1, 2012, under article 12, the exemptions were applied for crude oil and petroleum products are:

1. The provision of insurance for which insurance is required to perform contracts for the purchase, sale, important or transportation of crude oil or petroleum products from Iran.
2. Providing, directly or indirectly, third party liability insurance and environment liability (re)insurance.

Energy

In the energy industry, the principal sectors that are forbidden in the sale, the supply of transfer equipment, as well as technology, are refining, production, exploration of oil and gas, and liquefied natural gas (LNG). Training, technical assistance, financing or financing assistant for the foregoing list are prohibited. The prohibition is also applied on the provision of financing straightens to the granting of any loans or credits to the Iranian oil industry, the acquisition or expansion Iranian oil business's presence and the setting up of any Joint Venture in Iranian oil sector.

Export and Import

Prohibitions in export and import were applied in respect of certain goods. Generally, it was forbidden to sell, supply, transfer or export, directly or indirectly dual-use goods, technology and equipment to Iran, which might be applied for internal repression. Also, the restrictions on the import into the EU and goods' purchase from Iran was also adopted. Besides, the embargo was also expanded in core equipment and technology that may contribute to enrichment, recycling or heavy water activities or to nuclear weapons systems development (Annexes I, II, III and IV of EU Regulation). There were also restrictions covering arms, all other material, goods and technology mentioned in Common Military List (Common Military List of the EU, adopted by the Council). However, the most common restrictions are providing technical assistance, financing or financing assistant namely grants, loans and export credit insurance).

Transport

In transport sector, certain of restrictions were set out, including the requirement to have additional information of pre-arrival or pre-departure of goods from/to a Member State to/from Iran. Furthermore, the action of inspecting cargoes, air and sea to/from

Iran were also required if there is reasonable evidence that the cargoes contain goods, the sale, supply, transfer or export of which are not allowed under the sanctions. With the agreement of the flag State, member states may require inspecting cargoes at sea and they also must cooperate with the inspection requirements of other Member States. The cargo which is considered as prohibited goods shall be confiscated and disposed by the Member State, and the costs are borne by the exporter or importer or the person who has responsibility for supply, sale or assignment.

Providing bunkering or services to vessels by nationals of Member States to vessels owned or contracted by Iran, encompassing charterers prohibited from charter if that country has reasonable proof to convince that the restricted items under sanctions are carried on the vessels apart from services for humanitarian purpose or the inspected cargo.

2.2.3.3 National Sanctions

Since the nuclear program has edged closer to the capability of weapons, the nations concerned about this prospect have focused on sanctions as their priority policy tool. Over the past decade, many countries have put severe sanctions into practice to achieve their strategic goals of changing Iranian nuclear policy. However, United States, South Korea, Japan and Australia are the nations which imposed the sanctions influencing directly on the growth of Iranian oil industry.

United States

Over the past 20 years, the United States has been enlarged continually complex sanctions aiming at Iran. The first American sanctions against Iran began in November 1979 as a result of the hostage crisis, following that punishment, the U.S. government froze \$12 billions of Iranian government assets in the US and US banks overseas. Following this event, in 1987, a new embargo on goods and services in Iran was implemented due to the support from Iran to international terrorism and the actions competing for non-belligerent shipping in the Persian Gulf. In 1995, President Bill Clinton, following the increase in public's concern about Iran's support for terrorism and running after mass destruction's weapons, issued broad economic that prohibit all American trade with and investment in Iran through Executive Order 12957. On May 6, 1995, the Executive Order 12959 was signed in accordance with International Emergency Economic Powers Act (IEEPA) and International Security and Development Cooperation (ISDCA), in order to control substantially sanctions against Iran. After one year, he continued to sign Iran Sanctions Act, which was a "secondary"³ sanctions, banned on the firms investing on Iran's energy sector (Belfer Center for Science and International Affairs, 2015).

Following the 11th September terrorist attacks, President George W. Bush signed in executive orders and rules to supplement the terms of punishing terrorism's sponsors and all the activities relating to money laundering. On July 1, 2010, President Obama agreed and signed into law the Comprehensive Iran Sanctions, Accountability, and Divestment Act of 2010 (CISADA). The following year, in 2011, Washington reinforced the sanctions on commodities, services, and technologies for Iran's petrochemical sector. From 2012, an additional measurement was added that had effects on oil's export sector. (See Table 2 below for details of major sanctions imposed by US and

³ Companies, that were not based in the US, also had to face with sanctions. For example, between the companies and the US would not exist business relations if they were doing business with Iran, specifically in its energy industry (Belfer Center for Science and International Affairs, 2015)

Table 3 for the sanctions oil Iran's oil sector)

TABLE 2. MAIN US SANCTIONS, 1984-2012

Year	Description of sanctions
1984	<ul style="list-style-type: none"> • January: US started to target Iran as a supporter of terrorism and restricted more severe in exports. • February: Chemicals' exports used in the production of chemical weapons were embargoed. • September: Permission to provide aircraft and repair parts were rejected.
1987	<p>October: Scuba diving gear was denied to export from Iran in order to prevent the operation of mines.</p> <p>Iran's oil sales and 14 kinds of goods used for the military were embargoed.</p>
1992	<p>October: A ban on provision of nuclear materials, goods for military and refuse of bank financing.</p>
1994	<p>November: Iran's import of uranium from Kazakhstan was locked.</p>
1995	<ul style="list-style-type: none"> • January: A forbidden on trade between Iran and other countries was introduced with the exception of humanitarian commodities. • March: American companies were prohibited from the financial issue and project management of Iranian oil development. • April: Direct and indirect investment from US were blocked. • December: Limitation for foreign companies' investment (\$40 million) to Iran's oil and gas sector were approved, following the Iran Sanctions Act.
1996	<ul style="list-style-type: none"> • June: The Iranian sanctions bill was passed. • July: A Senate version of the Iran Sanction Act came into effect. Accordingly, the limitation of foreign investment would be reduced to \$20 million.
1997	<p>August: Iran was embargoed to import American commodities, technology, and services.</p>
1998	<p>May: Weapons were banned to import to Iran</p> <p>The support from US to foreign firms which helped Iran create missiles was locked.</p>
2000	<p>April: The cooperation between Iran and North Korea for missiles improvement was interdicted under the Arms Export Control Act.</p>
2002	<p>February: Iran was banned from participating the WTO.</p>
2006	<p>September: Iranian Bank Saderat was blocked to access to the system of US finance.</p>
2007	<p>January: Iranian Bank Sepah was not allowed to delegate US banks for handling transactions.</p>
2008	<p>August: Iran's maritime carrier IRISL was forbidden to transfer funds via US banks.</p>

Year	Description of sanctions
2010	<ul style="list-style-type: none"> January: The sanctions on Iranian gasoline providers were enabled. July: The Iran Sanctions Act was expanded. December: A new punishment was implemented on shipping company IRISL.
2012	<ul style="list-style-type: none"> March: Further sanctions on Iranian oil traders were approved. July: Iranian energy industry and banks which had business relations with Iran were penalised.

Source: Economic Sanctions and Nuclear Proliferation: The Case of Iran

TABLE 3. US SANCTIONS ON IRANIAN OIL SECTOR

Trade	<ul style="list-style-type: none"> The purchase or facilitation of transactions regarding to Iran's oil is prohibited for the US companies. Only Asian buyers such as China, India, Japan, South Korea, Taiwan, and Turkey can import Iran's oil at a fixed volume.
Revenue	Income from Iranian oil sales to the importers above is blocked, in line with the law of the US's punishment.
Transportation	<ul style="list-style-type: none"> Ability to carry Iran's crude oil is limited due to the prohibition from equipping (re)insurance services to oil companies or tankers in Iran. A restriction on supplying vessels to Iran or services to its shipping.
Investment	<ul style="list-style-type: none"> Companies are banned to provide equipment used in Iran's oil production. Foreign companies are also prohibited from making significant investments in Iran's oil.

Source: Sanctions Against Iran: A Guide to Targets, Terms and Timetables

South Korea

In 2010, South Korea announced to ban financial transactions with Iran and other independent sanctions as part of a US – led the campaign to implement sanctions against the countries in its nuclear enrichment program. In particular, South Korea prevented the efficiency of the Seoul office of Bank Mellat which accounted for 70 percent of transactions in export from South Korea to Iran.

Moreover, South Korea targeted 126 Iranian companies as well as individuals in economic sanctions including major banking activities, although Iran warned that sanctions would jeopardize trade relations and the energy ties. However, South Korea declared that it would not diminish import from Iran but new investment, technical services, financial services and constructing contracts were preheated.

Japan

In the line with South Korea, Japan also tightened sanctions against Iran in 2010, which exceeded the steps required by the UN Resolution. Under these sanctions, Japan listed a total of 88 institutions and 24 individuals in regard to the asset freeze.

The restriction of sanctions included the ban on new investment in energy development, restriction on financial transactions and freezes assets of people, and organizations connected to "nuclear activities" of Tehran (Dickie, 2010). Furthermore, the additional restrictions were also adopted on Japanese investments in Iranian development projects of oil and gas.

Australia

Australian sanctions on Iran were first imposed in October 2008 which fully implemented the UNSC sanctions regime. In 2010, new additional sanctions were enforced in order to strengthen the UN Security Council Resolution 1929 and autonomous sanctions. Australia supplemented 98 entities and 12 individuals which were designated in terms of financial and travel restrictions. Indeed, these targets focused on Iranian financial and transport industry, including 26 subsidiaries and affiliates belonging to the Islamic Republic of Iran Shipping Line which shipped goods relating to nuclear program and missile of Iran. Moreover, in the new sanctions, Australia accepted the limited measures in oil and gas trade between Australia and Iran for the first time because it was noted in UNSC Resolution 1929 that there is a relation between the revenue from oil and gas sector and funding for Iranian proliferation activities. Another reason was mentioned that the goods utilized in this field might be used in the forbidden nuclear program of Iran.

2.2.4 The reasons behind sanctions

There are many reasons in the forms of punishment that they aim to be the most predominant influences. According to Majidi and Zarouni (2016), the main reasons of the sanctions can be summarized as follows:

- Targeting to affect policy or even shift the system of target country's politic.
- Inflict a sanction on a country owing to its policies.
- Create instability within target country in order to reform its political system.
- Encourage human rights, against terrorism and ban on weapons of mass destruction.
- Boycotting the country which denounces the action from a sanctioned country.
- Minimise the power in target country's military activities.
- Vexatious premonition of a target country from the future policies which this country will pursue in the future.

2.2.5 Sanctions relief on Iran's oil

On 16 January 2016, Iran was confirmed by the International Atomic Energy Agency (IAEA) about complying its obligations in accordance with the Joint Comprehensive Plan of Action (JCPOA)⁴. As a result, the first pace of Iran's sanctions relief went into effect and was endorsed by a UN Security Council Resolution according to a study from Harvard Kennedy School (2015), which included:

⁴ The JCPOA was agreed on 18th October, 2015 (Adoption day) by E3/EU+3 (France, Germany, the United Kingdom, the European Union, China, Russia and the US) and Iran (Belfer Center for Science and International Affairs, 2015).

- “terminate” sanctions from UN
- “terminate the enactment” of EU sanctions
- “cease the implementation” of US sanctions

As outlined in the first section, sanctions include a wide range of sanctions on many perspectives of Iran, especially on trade. Sanction relief has opened some certain possibilities for Iran’s oil. Below is a brief overview of the most important changes in EU and US sanctions which have effects on Iranian oil industry.

TABLE 4. US AND EU TERMS OF SANCTIONS RELIEF ON IRANIAN PETROLEUM SECTOR

US	EU
<ul style="list-style-type: none"> • Foreign affiliates which are owned or managed by US enterprises after lifting of sanctions can participate in several Iran’s activities, but with certain restrictions. In other words, the subsidiaries of US companies now are allowed to enter Iran’s market. • Non-US can purchase and invest in Iran’s oil, apart from very limited situations 	<ul style="list-style-type: none"> • The limitation on Iranian counterparts’ purchase, import and carry of crude oil as well as oil products. • The supply of crude oil services, which were temporarily interrupted. • The restrictions on sales, provision, transfer, and export of necessary equipment and technologies related to the oil sector. • Investment prohibition, banning on the participation in, financing of and collaborate with Iran’s oil companies. • The ban on (re)insurance provision and involved brokerage services.

Source: Debrauw.com, reuters.com

In the next following chapters, the overview background and the impact of foregoing sanctions will be described in details with regards to production, export volume, and main traders.

Chapter 3 Methodology

The topic is about an Iranian ease of sanction which happened currently (2016); thus, there are not many types of researches that have been done in this field before, as well as not any books analysing its effects on global crude oil markets. Consequently, this research is conducted mainly in qualitative methods but also to a smaller extent in quantitative research. The qualitative approach is based on interviews with people in the different background working in this industry. By doing that, we can get a wider overview of Iranian crude oil sector under punishment and then benchmark to impacts on the global market. In this method, we also applied the case studies that allow the research to compare what the other countries did and were affected by the similar condition. In addition to qualitative research, this research is also explorative in quantitative which is based on books relating to oil perspective, publications and articles or studies of BP, International Energy Agency and OPEC.

3.1. Qualitative data

3.1.1. Interviews

The oil market is a complex phenomenon depending on many perspectives namely economics, politics or market; therefore, semi-structured interviews with experts who have deep knowledge about oil market is necessary. These interviews encompass a few key questions that are set to the suitable level of competence of the interviewee. The common questions will be asked are:

1. Which factors are the most important that can have effects on Iran's crude oil under sanctions?
2. What does the current crude oil market look like in Iran? How does it work under sanctions?
3. What are consequences of sanctions on Iranian crude oil industry?
4. In what way does Iran impact on global crude oil market? (in terms of production, export or prices, etc...)
5. How do you think about the picture of Iranian crude oil since embargo was decided to remove?
6. What do you expect now after the sanctions were lifted?
7. How long does it take for Iran to improve its position in production as before?

Through these questions and based on interviewee's responses, we want to compare and evaluate the impact of sanctions toward global and Iranian oil market. The questionnaire will be sent to the candidates via email if they are busy. The majority of interviews will be conducted by skype in case of long-distance interviewees or face-to-face for the ones living in Rotterdam.

3.1.2. Case study

According to Yin (2003), a case study should be used in the situations which can be answered "how" and "why" questions. Therefore, this research firstly aims to answer the question "How does oil sanctions influence on targeted countries?", in order to investigate the aspects that might affect Iran's crude oil market after international embargo was implemented. So that, besides the interview, case study analysis is decided to be chosen as one of the main methodologies of this thesis.

Two case studies are selected for this research are the case of Libya and Russia that will be described clearly in the next chapter. The reasons for the case studies' choice are represented as follows. First of all, similar to Iran, Libya is one of the members of

OPEC and also was imposed sanctions on crude oil sector; thus, we can estimate what challenges Iran could experience by analysing the impacts that Libya has faced with. In addition, in terms of political issue, both Iran and Russia do not have good relations with US that make these two countries might have the same problem once sanctions were announced to crude petroleum by US.

3.2. Quantitative data

In order to have a clearer view of our research and the relationship among the factors that may impact on the crude oil market, the secondary data will be used. We have collected quantitative data about crude oil export volume, oil crude price and oil time charter in global and in Iran from 1973-2017. The data have been collected from previous research, companies' websites, published reports and databases sources. This information will be presented in graphs and interpreted with an aim to analyse the potential influences from lifted sanctions and forecast whether there are any opportunities for Iranian crude oil field.

Chapter 4 Results

4.1. Data collection

In this chapter, the interviews that were responded by 10 respondents for this study are summarized and analysed. This is a qualitative analysis of this study with a different opinion on several relevant perspectives. A set of interview questions can be found in chapter 3.

Our respondents are managers, consultants, and officers who are working for Netherlands – based and Vietnamese - based national, international or multinational companies in a range of oil industry. Our database involves personal data and it is protected by their requirements. In other words, our respondents are treated anonymously and their answers are secured only for this research. The interviews were conducted between June 2017 and August 2017.

4.2. Results from interview

4.2.1. Global and Iranian oil market during sanctions

Before turning to the analysis of the main part of this thesis such as the impact of sanctions, we first discuss the respondents' points of view of this topic. In our interviews, we started with a general question about which key aspects our interviewees believe that have the most significant impacts on both global oil market and Iranian oil market under sanctions.

Our respondents stressed that the crude oil market nowadays is no longer simple but complicated in many various ways. They agreed that supply and demand do not the only entities playing the major roles in defining the prospect of this market. Therefore, not only these two factors were affected when sanctions were imposed; there are a variety of other elements that play in as well. The majority of the interviewees believed that in terms of Iran, the punishment could disrupt six factors namely crude oil production, export, main importers, oil reserve and storage, crude oil price; especially under the additional sanctions in 2011. First of all, a manager among our respondents discussed that Iranian oil production decreased dramatically after global downturns between 2001 and 2008 because OPEC members made a deal to restrain crude oil production in order to prevent further falling on oil prices. However, even OPEC nations stepped up production, there was still stagnation on Iran's output. He mentioned this inactivity was a sign that sanctions could be working. He also emphasised no increase in Iranian crude oil production in 2011, and in fact reduced production. It shows Iran lost the capacity in production that presumably because of punishment. Moreover, most of our respondents drew the same conclusion that the new sanctions in 2011 caused a sharp decrease in Iran's crude oil export. Indeed, one of them depicted that Iranian crude oil export stood at 2 million b/d before additional sanctions and declined to 1 million b/d after additional sanctions were implemented. She also pointed out the other reasons for this downward trend in oil export are EU completely stopped its oil import from Iran in 2012 and the main buyers decreased their purchases in oil. Consequently, Iran would suffer from loss in market share in Europe to other producers namely Saudi Arabia, Iraq or Russia; and reduced the crude oil volume that imported to primary traders such as China, India, Japan and South Korea. In terms of oil reserve and storage, through our respondents' experience in this sector, they noticed that Arabian and Zagros Basin, that hold over 90% of Iran proved reserves, are the two regions Iran has been producing and reserving its crude oil the most. They also remarked that oil reserves in Iran located offshore account

only 30%, the remain is considered on onshore fields. Another area which Iran holds proved oil reserves is the Caspian Sea but due to territorial disputes with Turkmenistan and Azerbaijan, this region has been retained. Iran's main oil fields come from Central Zagros (such as Ahwaz, Izeh, Gachsaran or Masjid Soleyman) are the regions where oil has been extracting in the past 10 – 15 years. Nevertheless, due to the international punishment and no further presence of the international oil companies (IOCs), these oil assets could be developed uncertainty. Besides, the Persian Gulf also acts as a solid area for potential new discovery but the requirement of a significant collaboration with the IOCs in order to advance further exploration. Figure below is oil fields in Iran that we want to demonstrate clearly our interviewees' opinion.

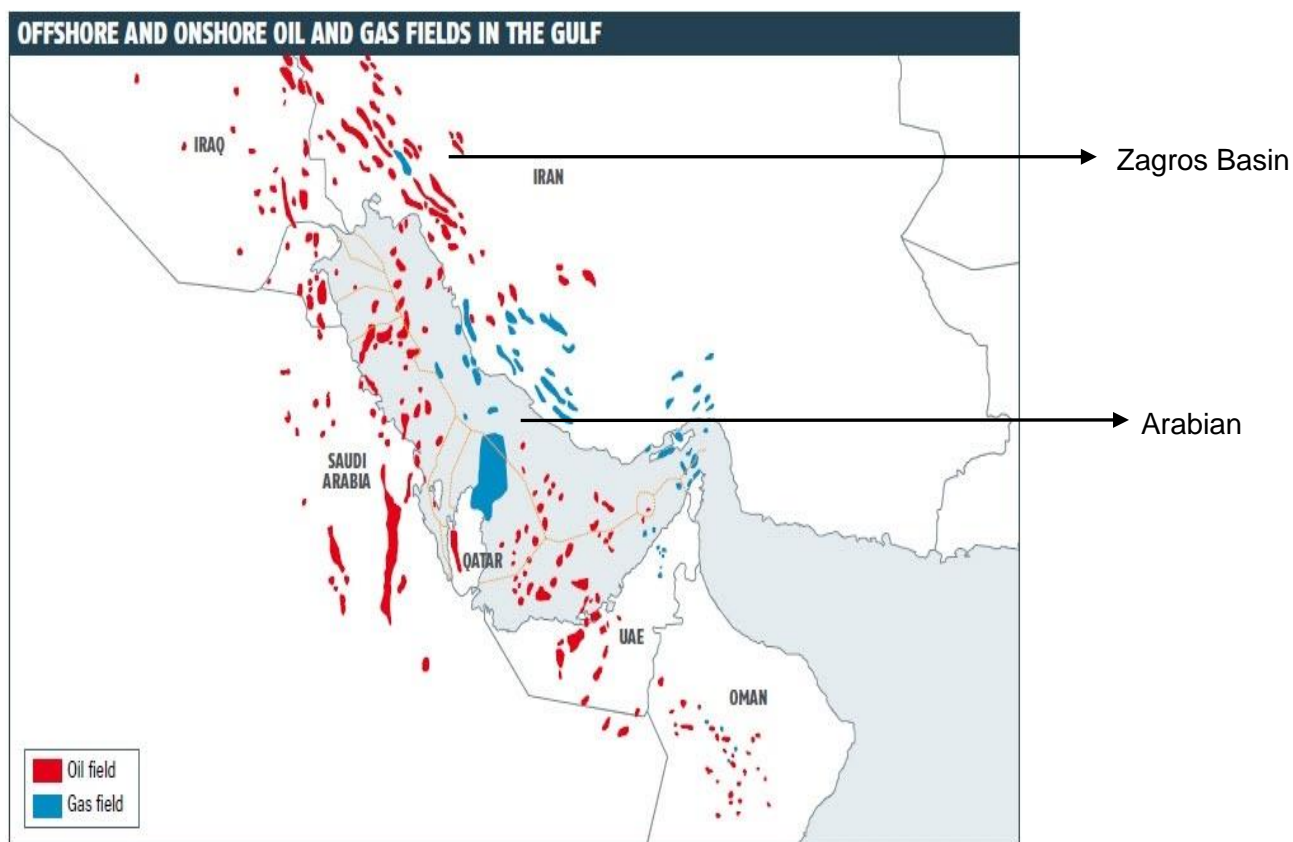


FIGURE 2. IRANIAN OIL FIELDS

Source: Middle East business intelligence

Finally, concerning to crude oil prices, it was stated that Iran's crude oil prices generally move upward under crude oil volatile market due to the international ban.

On the other hand, to determine the influences of Iran's crude oil industry on the global crude oil market, our answerers briefly explained that as Iran's crude oil market was unstable due to the international embargo, the global crude oil market was threatened, mainly OPEC nations. They emphasised the downfall in Iran's crude oil production could put pressure on OPEC and global production but give the chances for OPEC members to replace Iran on crude oil export.

4.2.2. Iranian oil market after lifting of sanctions

In addition to impacts under sanctions, interviewees were also asked whether the oil market in Iran would be changed notably after the removing of petroleum sanctions since 2015 or not. Generally, their answers are identical with the idea that an ease of sanctions will make crude oil production and export in Iran ram up rapidly. Some of them specified that the increase in export should be several hundred thousand barrels per day within several months. Particularly, most of the incremental barrels probably go to EU nations especially Italy, Spain, and Greece. As a result, there could be the effects on demand in OPEC nations because of some OPEC producers, such as Iraq, exported more crude oil since Iran's exports deteriorated under sanctions. When Western nations decided to end oil sanctions, the other members of OPEC need to reduce their excess production in order to remain the level of overall production in OPEC static. To sum up, they concluded that Iran, once a pariah, will put effort to re-enter into the global oil market and the return of Iran could lead to reshape global oil markets. Indeed, according to the interviewees, years of painful international sanctions have ravaged global as well as Iranian crude oil sector. However, the lifting of sanctions could also shake up oil market, especially oil prices. Due to the fact that Iran tries to pull oil out of its storage and from tankers floating at the sea, Iranian oil prices are lower and might be in a depressed circumstance for some time. As a result, after sanctions lifted, Iranian oil prices are in a tricky position because the more oil Iran exports, the more prices will decrease. The price crash could hurt Iran's overall revenues which will certainly interfere Iran's ability to oil trade internationally in a long term. In addition, cheap oil also could worsen Iran's comeback to the oil market and could be risky in investments of oil field upgrades. Last but not least, Iran has aimed to have low production costs compared to the other countries, but the decrease in oil prices will put this plan in risk.

4.2.3. The future outlook for Iranian oil market

At the end of the interviews, our respondents were asked to give their opinion about Iranian oil market's potential in the long term after sanctions removed. Most of them expected that Iran's crude oil production will continue to soar substantially. This upward trend in crude oil production will contribute higher growth in global crude oil production as a whole and lead to positive spillover effects on investment and consumption in Iran.

4.3 Case study

4.3.1 Libya

As one of the OPEC members since 1962, Libya has also played a key role in the oil sector. With the largest portion of proved crude oil reserves in Africa and the ninth largest in the world oil market, Libya's economy has been depending on oil production which contributes roughly 96% to the government revenue. Nevertheless, Libya has been in a complicated situation when the measurements from Western nations were forced and eased continuously.

The new round of sanctions imposing in 2011 from the US has been affected in respect of Libya significantly until now. In particular, the embargoes led to an asset of all the energy companies in Libya to be frozen. The punishment covered state-owned oil companies in Libya including Arabian Gulf Oil Company, Harouge Oil Operations, Sirte Oil Company, Zuetina Oil Company and Waha Oil Company (OpenOil, 2012). And international oil companies declared that they also have to comply with US and UN sanctions implementing on Libya. Besides to Western sanctions, Libya has also experienced the Arab Spring, which led to many widespread protests and bloody civil

war within this country between loyal citizen and rebels around the world. Those events happened in Libya caused the disruption in Libyan crude oil industry, especially in production and export.

4.3.1.1 Crude oil production

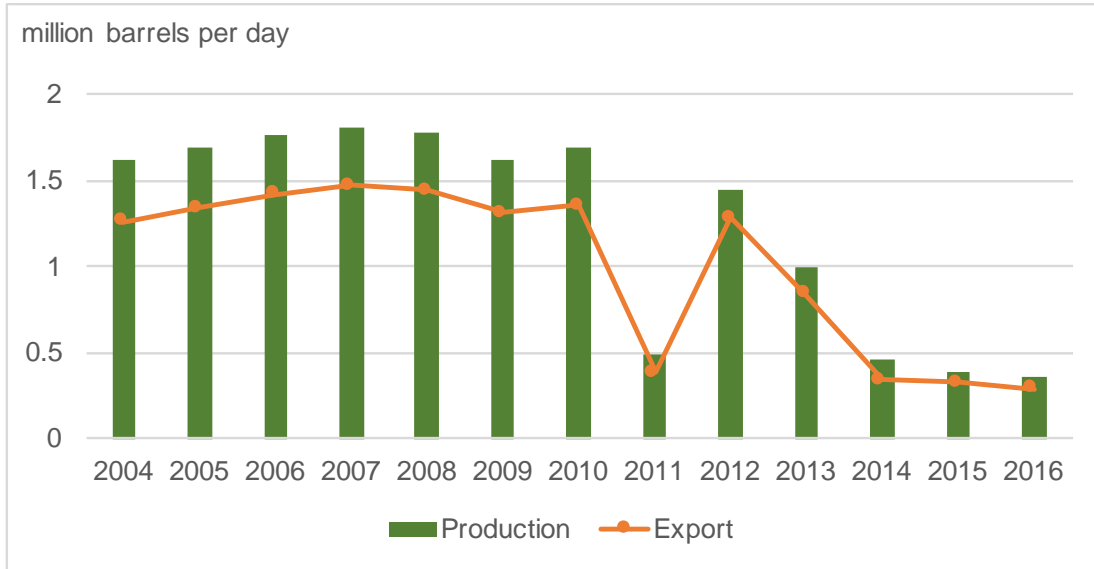


FIGURE 3. CRUDE PRODUCTION AND EXPORT IN LIBYA FROM 2004 TO 2016

Source: FRED Economic data

According to the report of BP, Libyan crude oil reserves account for 3.4% of total global oil reserves. At the end of 2010, it was estimated at 46.4 billion barrels, increasing (20.3) compared to the reserves in 1980. With this impressive upward in proven oil reserves, Libya produced a massive output that exceeded the production quota setting by OPEC (EIA, 2011). Back to 2004, production of Libyan crude oil was still in a positive picture with 1.62 million bpd. Since then, the outcomes slightly ramped up and reached a peak in 2007 at 1.8 million bpd, highest level over the last 10 years. In 2010, Libya produced 1.69 million bpd of crude oil which was above OPEC's limited production at 1.47 million bpd, but it was still 150,000 below Libyan capacity. However, after EU applied new restrictions on Libya's oil sector in 2011, its production reacted directly toward the sanctions. Indeed, crude production in Libya dramatically dropped to 0.5 million bpd that made some oil companies tried to escape from this market (French Total, the Italian ENT, the Spanish Repsol and the American Occidental). This notable decline in production and the eluding of foreign companies caused a severe and profound influence on oil prices. After one year of the obstacle from civil war, EU cancelled sanctions in late December 2011, the decision resulted in an optimistic view for Libyan crude production that rose to 1.45 million bpd in 2012. In addition, foreign oil companies started coming back to Libyan market and certain investments were dealt during this time. Consequently, Libya had opportunities to catch up the market and reach to pre-crisis level in terms of production.

Libyan, however, was going through another crisis on the oil industry only two years after the civil war. In the mid-2013, Ibrahim Jidran, a leader of the Petroleum Facilities Guard (PFG) took an initiative in a blockade at some of the major ports to the East,

along with protests and closures in the Western oil fields and pipelines. This crisis crippled Libyan oil industry, particularly causing the shut-in of crude production in Libya. Since 2014, crude oil production in Libya fell to almost zero and there was no signal of recovery until 2016.

4.3.1.2 Crude oil export

In terms of crude exports, Europe is the leading importer of Libya which contributed 84% in 2014 (Figure 2). And about 14% of Libyan crude oil went to Asian and Oceania. Among European countries, Italy imported the most volumes of crude oil from Libya with 28% in total. France and China received the following highest proportion in Libya’s export at 15% and 11% respectively. Germany and Spain were also the major buyers of Libya in the European market.

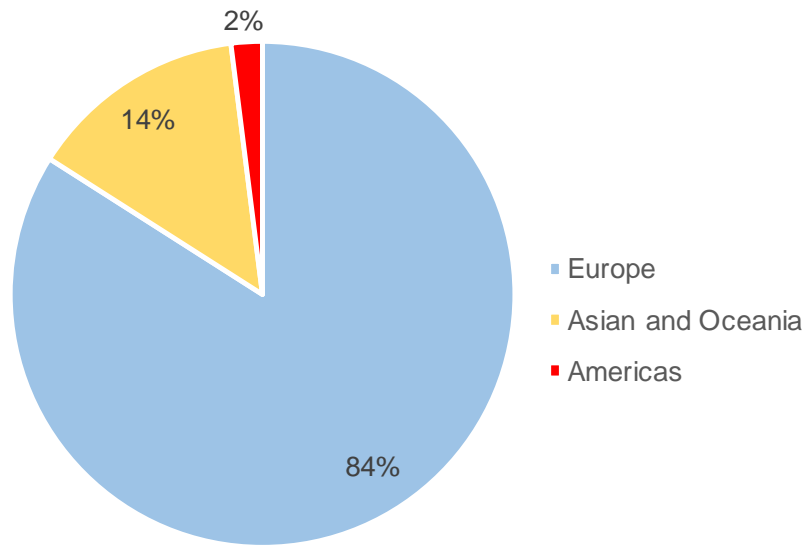


FIGURE 4. CRUDE OIL EXPORT IN LIBYA, 2014

Source: US Energy Information Administration

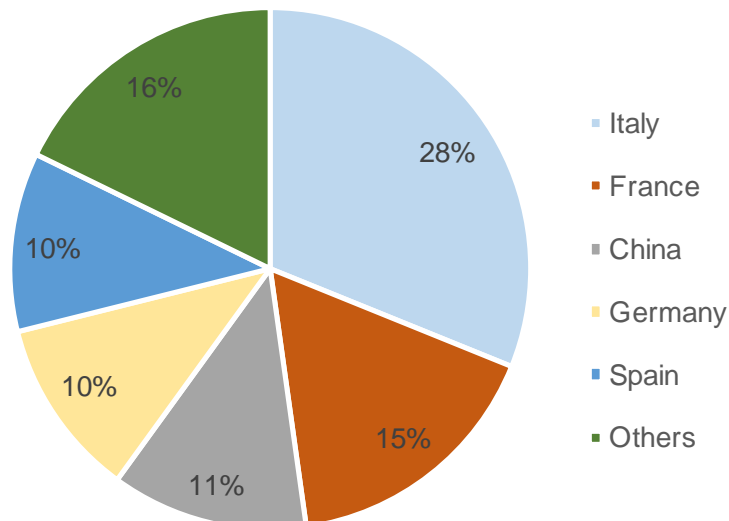


FIGURE 5. LIBYAN CRUDE OIL EXPORT DESTINATION IN 2010

Source: Libya Oil Almanac: An OpenOil Reference Guide

As can be seen from Figure 1, Libyan crude oil exports followed the same path to crude production. Prior to 2011, the crude sales were around 1.3 – 1.5 million bpd and was curtailed due to the interruption of oil production under sanctions and civil war from 2011 onward. In 2014, 0.34 million bpd were sent to the consumers, which was lower than the level in 2012 (1.28 million bpd) and by far below the pre-crisis level. The decrease would continue until 2016 but it was not considerable. As a result of this significant downward trend, we suppose that Libya will not be able to return to the pre-crisis level in a long term. With a country's economy depending on the oil sector, this situation could hurt Libya's economy negatively.

Concerning to crude oil prices in Libya, because of the worse circumstance in crude output and exports in Libya, the prices were more volatile and began to climb rapidly until reaching the highest in April 2011. However, the prices still continued to fluctuate and hit bottom at \$30.89 per barrel in February 2016.

4.3.2 Russia

In 2014, in response to repeated the sovereignty's violations and Ukrainian territorial integrity, Western countries decided to impose the embargo on Russia. Similar to Iran, Russia is one of the countries which has crude oil sector as the core industry and the world largest producer as well as exporter in the world. As a result, the restrictions from Western countries, especially the US, have been affecting the most on this. Under the sanctions, advanced technologies and foreign investment were limited to access into Russian oil companies. Specifically, four main Russian's firms are targeted not allowed to access to US markets namely Novatek, Rosneft, Gazprom Neft and Transneft (EIA, 2016). Additionally, Western companies were also abandoned their presence in new oil fields exploration and stopped supplying modern technology for geological researches and heavy oil production (Mäe, 2016). The EU also implemented restrictive measures on Russia relating to destabilising in Eastern Ukraine. However, these embargoes would have little impacts on Russia's crude production in the short term because Russia did not consider about putting these resources into production for at least the next 5 to 10 years. The sanctions would lead to an immediate effect in stopping large – scale investments from Western companies.

4.3.2.1 Crude oil production and prices

In spite of punishment from Western entities, the negative effects on production and oil prices in Russia have been limited. The reason for that is because Russia has a potential resource and even with cheap oil, this country still can gain profit from oil projects. Forbye, most of Russian oil fields have low production costs. For instance, the production cost in Rosneft is \$2.1 per barrel (Larchenko & Kolesnikov, 2017).

Regarding to oil production, there was a slowdown in the Russian crude output and also in the global market. It was reported that in mature fields, the volume of crude production declined 5% per year in an average. A decrease in production was explained by a reduction in oil reserves and the delay in foreign investment in Russia.

The decision of applying sanctions at the same time from the US and the EU have caused the decline in crude oil prices by more than half. It was reported that in the first half months of 2014, Brent crude oil price in average fell from \$109 per barrel to only \$52 per barrel in 2015 and further decreased during mid-2016 at \$40 per barrel (EIA, 2016). In general, the fall in prices put burdens on Russian economy and revenue from crude oil activities. Above all, it also reduced the flow of investments from overseas. According to Larchenko and Kolesnikov (2017), compared to the previous period, foreign investment's growth was less than 1%.

4.3.2.2 Foreign companies and investment

Due to the restrictions, several projects for Russian's future crude oil that foreign oil companies intended to participate were disrupted. For instance, Shell and Total ended the cooperation with Gazprom Neft and Lukoil on the project of heavy oil production. Or ExxonMobil came to a stop with Rosneft on oil deposits exploration in the Kara Sea belong to Russian Arctic (EIA, 2016). However, restricted measures did not apply to affiliated companies in Russia. Hence, oil service companies came from Western holding company outside Russia could keep working on current oil deposits.

Under sanctions, issues relating to finance in Russian became a barrier so that the interest of Russia's oil companies in projects with large investments from oversea investors has been reduced. The cutback on foreign credit forced them to pay attention to oil deposits' productivity. However, it requires modern technology supplied by foreign oil service companies, whose activities were not influenced by Russian embargoes (Mäe, 2016). In addition, punishment from international nations also prohibited Russia from foreign investment so that the Russian oil companies were enforced to request investment from the government or financial institutes of the countries that did not punish Russia. Nevertheless, not many oil companies could follow this way and it was not easy to apply for the support on investment. In fact, only two oil companies – Rosneft and Novatek – dared to request support to tackle their financial issues from the Russian government and Russian Welfare Fund (Mäe, 2016), only Rosneft was successful but it was not significant. Rosneft applied 28 projects and asked for 2 trillion rubles, yet only 1 was accepted with 44 billion rubles on investment. It pushed Rosneft to cut its investment in 2015 by 30% (Mäe, 2016). While Novatek only requested for one project with US dollars instead of rubles to purchase for equipment from the West, but the government rejected.

Based on the interview results and the two case studies below, we can conclude that in general, sanctions in Iran could shrink its crude oil production and export, the key clients and investment from foreign investors. These elements will be all discussed into details in the next chapter.

Chapter 5 Analysis

In chapter 5, the analysis to answer our main research question of this thesis will be discussed, based on the results from our interviews and the benchmark from two case studies. This chapter will also be further used as the basis for our conclusion and recommendation for the other studies.

5.1 Impact of sanctions against Iran

5.1.1 Iran

5.1.1.1 Iran oil production

As a founder member of OPEC, historically Iran was OPEC second largest oil producer. Nevertheless, the oil industry in Iran was disrupted by the Western embargo which diminished production level of Iran's oil. And, due to sanctions, Iran dropped behind Saudi Arabia, Iraq and United Arab Emirates (UAE) in producing crude oil; from being OPEC second largest to the fourth largest oil producer of OPEC in 2013 (US Energy Information Administration, 2014). According to EIA, the oil production in Iran demonstrated a positive picture during 1976 and 1977, with the average oil production recorded more than 5.5 million b/d and the highest level exceeded 6 million barrels/day. Since the Iranian revolution in 1979, under the influences of not only the measures from sanctions but also the war and limited investment, oil sector in Iran witnessed a significant decrease in production level (Figure 6). Although the production soared from approximately 2.8 million b/d to over 4 million b/d between 1990 and 2010, the oil production of Iran could not reach the peak points of the 1970s.

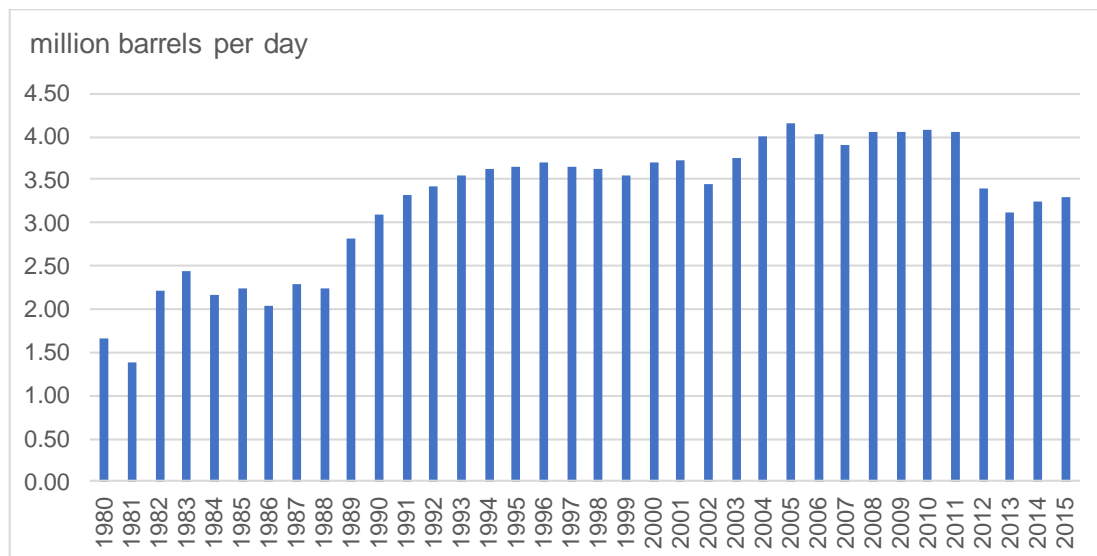


FIGURE 6. THE EVOLUTION OF IRANIAN CRUDE OIL PRODUCTION

Source: US Energy Information Administration

After the attribution of additional sanctions from 2011, oil production in Iran declined dramatically. Under sanctions, the US and EU punishment targeted to exports and imports of Iran's petroleum. Moreover, the prohibition of large – scale investment in its oil sector was also declared, which affected Iranian oil production. In 2011, Iran produced approximately 4 million bpd of crude oil and this level dropped by 13% to roughly 3.1 million bpd in 2013. Albeit an increase in oil production since 2014, Iran still faced with the low recovery in this industry.

The punishment from the other countries hit Iranian production hardest in Southern oil fields located in Central Zagros, which constitutes almost 86% of production in Iran. This is mainly because they are the most advanced Iranian oil fields and it made economic and technical sense less productive by minimising their Enhanced Oil Recovery/Improved Oil Recovery (EOR/IOR) operations (Vakhshouri, 2017).

5.1.1.2 Iran oil export

In the recent history, Iran has confronted economic sanctions, but the measures enacted since 2011 from US and EU were the most punishing. In fact, as can be seen in Figure 7, the sharp decrease in Iranian oil exports began in 2011, which was concurrent with the expansion of sanctions regimes. After the sanctions were strengthened, the oil exports slipped from 2.57 million bpd in the beginning of 2011 to 1.50 million bpd in the same period of 2012 and continued to go down to 1.13 million bpd in 2013. Even though the export volume increased in the first of 2015, it still did not help Iran return to the market as pre-sanctions.

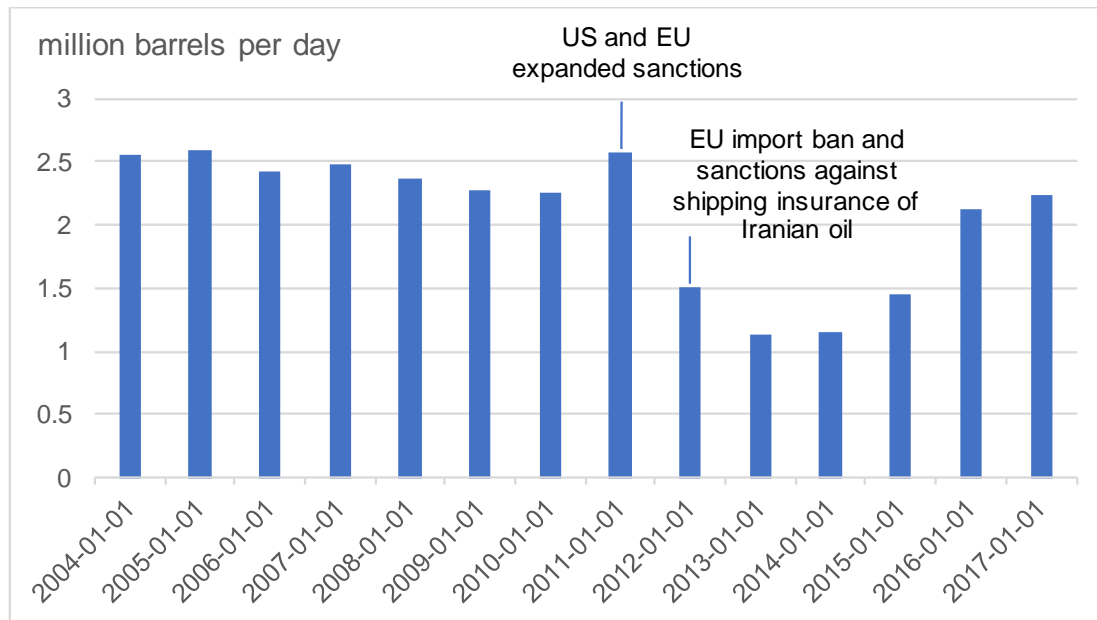


FIGURE 7. IRANIAN CRUDE OIL EXPORT FROM 2004 TO 2015

Source: Federal Reserve Economic Data

With many customers bowing to Western sanctions, Iran’s oil exports were dependent on five Asian countries. Indeed, for many years, Iran has sold a large volume of oil to China, India, South Korea and Japan. Asian markets have been purchasing nearly all of Iran’s oil, accounting for roughly 78% of crude oil’s export from Iran. Below, in Figure 8, the top Iranian oil importers and the share of total imports in 2011 can be seen. The data in Figure 8 clearly shows that oil exports in Iran depended especially on China, which has been its key trading partner for a long time. In 2011, China was estimated to consume 26% of Iran’s oil exports in total. Following China, India was also the lead oil importers in Iran which consumed 24% Iran’s total oil exports. South Korea showed import of Iranian oil were up 19% and Japan also made up a big proportion, taking 15% of total oil exported. Relevant to EU market that contributed 22% of Iran’s crude oil import, the three main importers came from Italy, Spain and Greece with the import volumes were 1.82, 1.50, and 1.22 million bpd respectively.

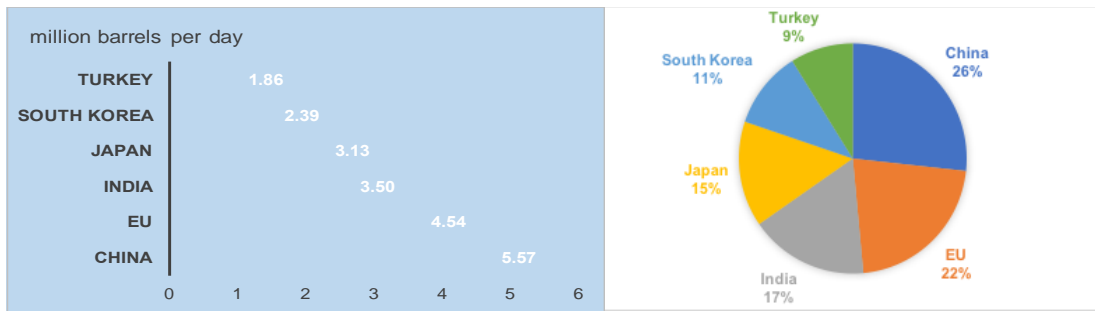


FIGURE 8. TOP IRANIAN OIL IMPORTERS IN 2011

Source: Eurostat, OPEC

However, as a result of US and EU sanctions strengthening, buying Iranian oil became problematic; the traditional buyers of Iranian oil, therefore, reduced their purchases in crude oil but it seems that the reduction was not significant. It can be seen that Iran crude oil exported to its top importers (China, India, Japan and South Korea) slumped from 1.44 to 0.94 million bpd during 2011 and 2013, declining roughly 21% after additional sanctions in 2011. Turning to the details, China was not controlled by any UN Resolutions or unilateral Resolutions of the US and the EU in Iranian crude oil imports. Therefore, China could choose to follow the sanctions or slightly decrease imports from Iran. Besides, Turkey decided to cut crude oil imports from Iran, but only 10%. Japan and South Korea also reduced their payments for Iranian crude oil, by decreasing approximately 26% and 33% respectively in the volume imported (Harmer, 2012).

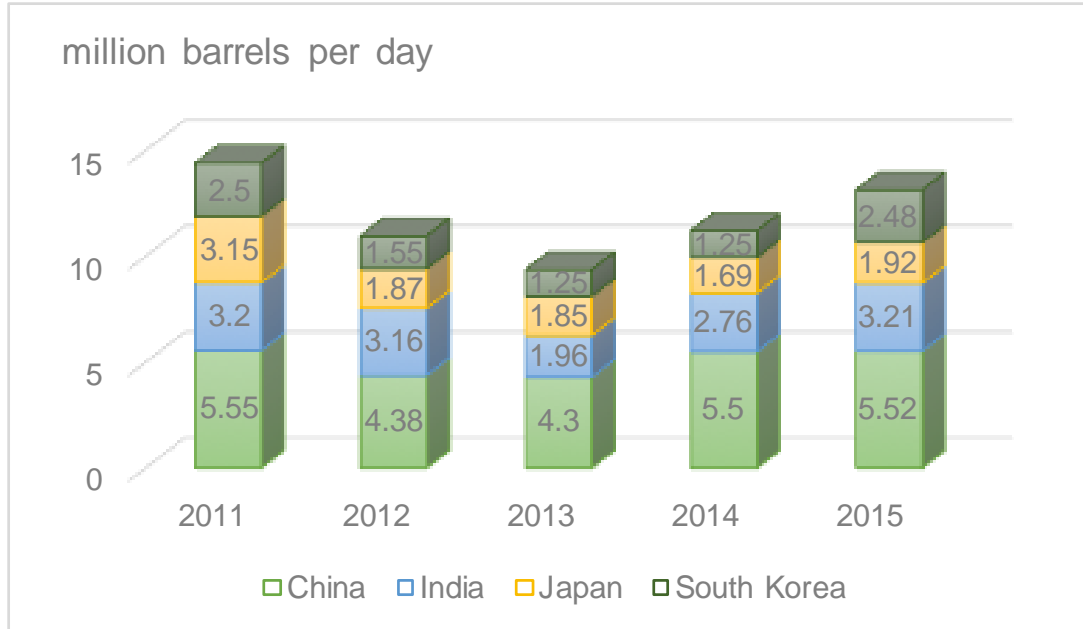


FIGURE 9. THE OIL VOLUME EXPORTED BY MAJOR IMPORTERS FROM 2011 TO 2015

Source: Middle East Institute, 2016

Lastly yet importantly, EU gradually cut down the imports of Iran's crude oil since sanctions expanded. According to OPEC, Greece was the only country in EU

imported crude petroleum from Iran in 2013, and Italy was the only EU destination where Iran exported its crude oil to from 2014 to 2015.

Notwithstanding, there was a slight surge since 2013 yet the growth was not impressive to help Iran reach the previous import volume as pre-sanctions.

5.1.1.3 Iranian crude oil reserves and storage

Iran's oil resources were enormous after Iran had become the main oil producer. According to a report by EIA in 2014, nearly 10% of total world's crude oil reserves and 13% of OPEC reserves were held by Iran. Particularly, 70% of Iranian crude oil reserves were explored on onshore, while only 30% mostly located offshore in the Persian Gulf. As previous foregoing in chapter 4, the main two areas of Iranian proven reserves are Arabian and Zagros Basin which accounts for 90% of total Iran's crude oil proven reserves.

Due to sanctions, Iran's crude oil production has been suffered for many years. For this reason, by increasing crude oil proved reserves, Iran could have a chance to recover its crude oil production for the next few years. Figure 10 below illustrates the Iran's proved oil reserves growth from 1980 until 2015.

A glance at the graph demonstrated that during the first 7 years of sanctions from US and most importantly because of the war between Iran and Iraq, the proven reserves in Iran were degenerate. During this period, upstream activities were restricted which caused Iran's production was inevitably somewhat curtailed. The enormous growth in Iran's reserves level has continued since 1988, after one year the USA enforced the first term of oil punishment. In 1988, Iran rose its level of proven reserves to 93 bn bbl, by 90% compared to the previous years. Over the next 30 years, Iranian proven reserves have continued to be reported as increasing in estimates of proven reserves. Specifically, Iran announced an upward trend to 158 bn bbl in 2015. It is clear that proven reserves uplift more than sanctions than any other causes (McDonald, 2015).

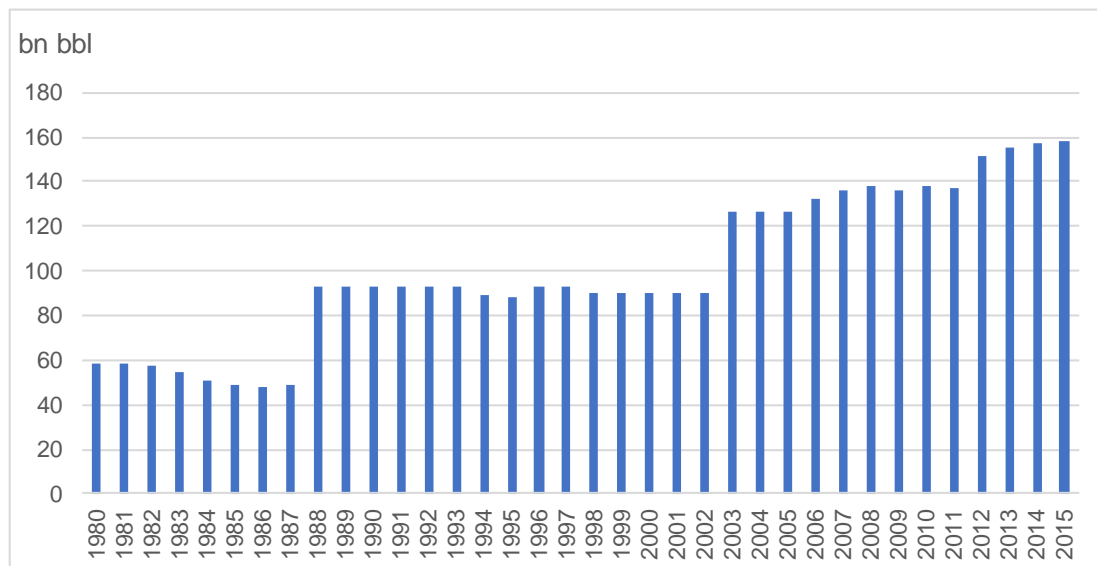


FIGURE 10. IRAN'S PROVEN OIL RESERVES, 1980-2015

Source: Oil and Energy Trends

Regarding to crude oil storage, as the result of the international penalty, Iran's crude oil has been unable to sell. So that, Iran's inventories have increased over the past 3

years and it will need a large its onshore and floating storage proportion to stockpile its reserves. However, according to our respondents, there is a limitation in onshore storage, Iran’s tankers as VLCC fleet, thus, were being used to store oil. Each vessel is able to carry 2.1 million oil barrels in average. It is also estimated that total floating storage in Iran reached a peak over 40 million barrels in the half year of 2015 (APICORP, 2015).

5.1.1.4 Iranian crude oil shipping

After the added imposition of the embargo in January 2012, Iran’s crude oil shipping was influenced substantially, that made Iran lose a number of European and Asian clients was replaced by the shipments from Saudi Arabia, Russia, and Iraq. Because of the boycott from EU, any Iran’s crude tankers were banned from insurance coverage by EU. This decision significantly damaged crude oil transportation in Iran and led Iran use its tanker fleets for crude oil storage.

According to Yeganehshakib (2016), NITC was the most suffered from this issue. Under the rule, NITC’s tankers were blocked to access into world oil shipping; in response to this, its traditional customers namely Saudi Arabia, Kuwait, United Arab Emirates, Venezuela, Nigeria, Gabon and Norway stopped the contracts for carrying oil with the company.

5.1.2 Global crude oil market

5.1.2.1 Crude oil production

Based on the information we accumulated from the interviews, our interviewees supposed that the volatility of Iran’s crude oil sector could adjust the global crude oil market. They estimated that in respect to oil production, the output in global could be down when Iran reduced its production. Nevertheless, our analysis of the sanctions imposed, especially the new restricted deal in 2011, concluded that the pressure on global crude oil production was non-existent. According to additional sanctions, Iran still could not be allowed to raise exports, so Iran still remained the same volume of crude oil production as it produced. That’s why global production would not react much to the sanctions’ announcement.

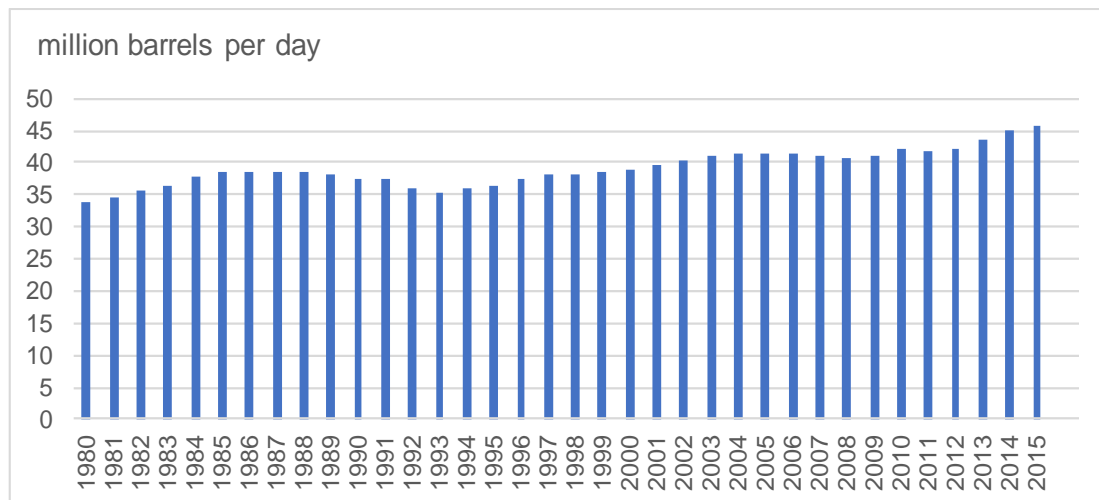


FIGURE 11. WORLD CRUDE OIL PRODUCTION FROM 1980 TO 2015 (EXCLUDING OPEC NATIONS)

Source: U.S. Energy Information Administration

Figure 11 above interprets the crude oil production of all countries without OPEC nations during 1980 and 2015. As it observed, the figures for global crude oil production climbed gradually from 33.9 million bpd in 1980 to 42 million bpd in 2010. In spite of new ban against Iran in 2011, the worldwide output still stabilised and then continued to go up slowly with the volume of 45.9 million bpd in 2015.

Likewise, the crude oil production of OPEC has not been changeable substantially apart from a sharp downfall in the first time of Iranian sanctions started in 1979 (Figure 12), although Iran (11%) is one of the three members that has the greatest share of total OPEC crude oil production beside Saudi Arabia (29%) and Iraq (12%). One reason for this is that the loss in export volume of Iranian crude oil has been covered by supplementary output from Saudi Arabia and Iraq.

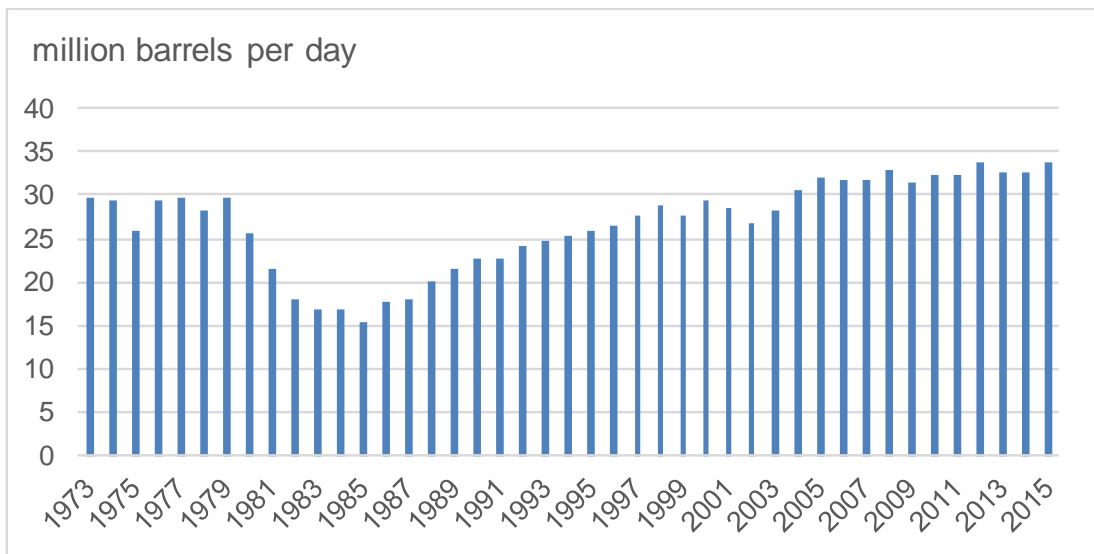


FIGURE 12. TOTAL OPEC CRUDE OIL PRODUCTION FROM 1970 TO 2015

Source: U.S. Energy Information Administration

5.1.2.2 Crude oil prices

Like the other commodities' prices, crude oil prices also undergo fluctuations in times of shortage or oversupply from the market. As described in Figure 13, crude oil prices varied from 1975 until 1998; and between 1999 and mid-2008, the price of crude oil went up dramatically from \$16.56 to \$91.48. As the ongoing sanctions' announcement in 2011, US and EU intended to force Iran to surrender to its nuclear program by pressuring in Iranian crude oil exports. Consequently, the prices reacted in an upward trend in crude oil market after this event. Indeed, during the first quarter of 2012, crude oil prices rose considerably and then dropped during the second quarter before jumping sharply at the beginning of the third quarter (US Energy Information Administration, 2012).

Moreover, Iran has played an underestimated role in the Strait of Hormuz, which is a narrow seaway 17 million b/d of crude oil are carried to markets in Asia. Since the US and EU sanctions took into effect, Iran with its proximity to other main oil producers in the Persian Gulf retaliated by a huge disruption of oil shipments via the Strait of Hormuz, that also caused crude oil prices to go up.

As the result of higher crude oil prices caused by the oil embargo, transportation costs of crude oil tanker operators increased and it imposed a greater burden on the crude oil tanker market. Therefore, this pressure may interrupt the transportation of crude oil around the world (Shi and Li, 2013).

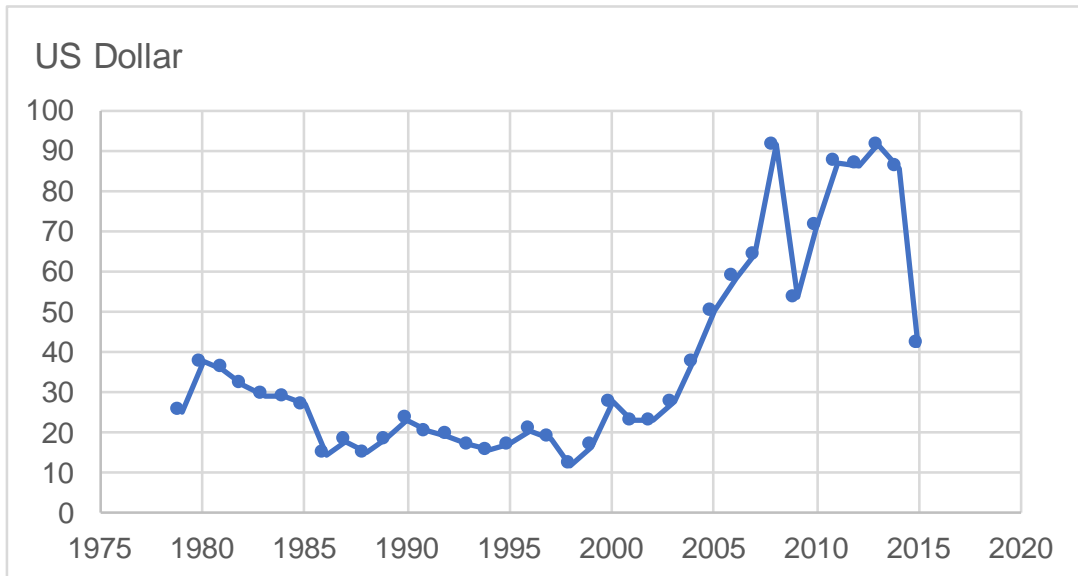


FIGURE 13. CRUDE OIL PRICES FROM 1975 TO 2015

Source: InflationData

5.2. How does an ease of sanctions influence on the crude oil market in Iran?

In January 2016, following the execution of the JCPOA, the UN, EU, and US agreed to curtail sanctions related to nuclear program and finance after compliance with the nuclear deal. The most significant impacts of removing sanctions are Iranian oil market which mainly encompasses production, export, term and transportation agreement, and foreign investment with new contract model.

5.2.1 Crude oil production

Once sanctions were effectively lifted, Iran started ramping up its crude oil production moderately because of the aim of reaching pre-sanction level of production. In 2015, production of Iran's crude oil was estimated at 3.3 million bpd and increased by 4% to 3.5 million bpd in the beginning of 2016 (Figure 14). Just four months after the lifting of sanctions, Iran's crude oil production pumped to 4.1 million b/d which was the fastest pace since mid-2011. It continued to go up gradually to 4.5 million bpd and remained stable until April 2017. The reason for the steadiness in production was the Trump administration declared new sanctions against Iran.

A recovery in Iranian crude oil production coupled with the EOR/IOR techniques and the re-use of water and gas would boost the output in core southern oil fields rapidly. In fact, the outcomes in Southern regions jumped by 0.5 million bpd since January 2016. Furthermore, the output from less developed oil fields also shot up and the most considerable newly developed regions are the West Karun oil fields. Between late 2015 and October 2016, the crude oil production in West Karun more than doubled, from 0.1 million bpd to 0.28 million bpd and was predicted to reach 0.7 million bpd by 2017 or early 2018 (Vakhshouri, 2017).

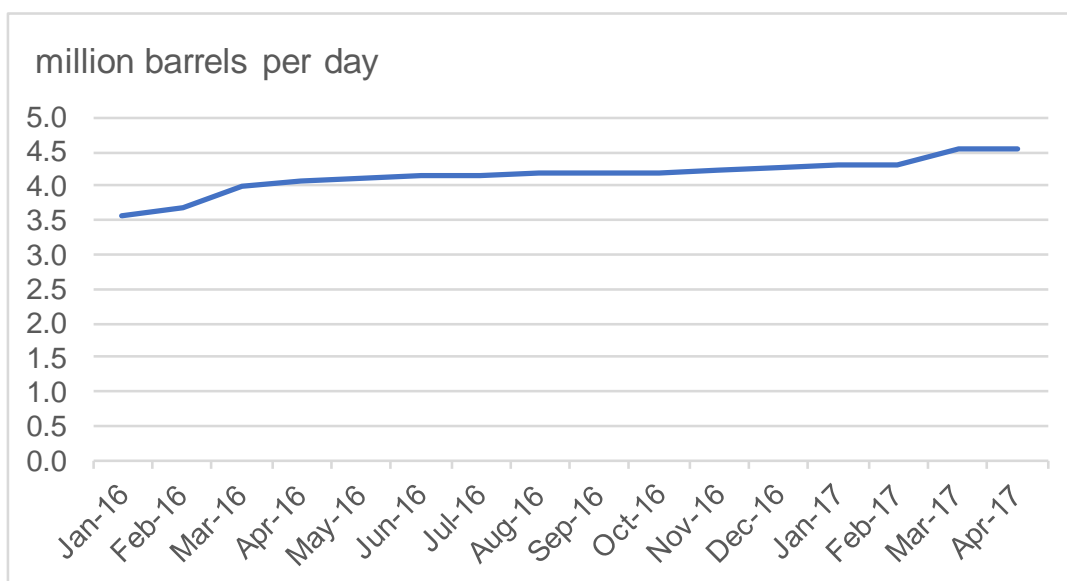


FIGURE 14. IRANIAN CRUDE OIL PRODUCTION IN 2016 AND FIRST FOUR MONTHS IN 2017

Source: YCharts

Iran's return to the crude market could trigger a price conflict with Saudi Arabia because Saudi Arabia has been trying to maintain low costs on its production and therefore the crude oil will be sold at the market prices.

TABLE 5. IRAN'S MAIN OIL FIELD PRODUCTION SINCE JANUARY 2016

Region	Field		Production status
West Karun Oil Fields	North Azadegan		The production reached 75,000 b/d in April 2016 and increased to 85,000 b/d in October 2016.
	South Azadegan		In January 2016, the production was 50,000 b/d and was estimated to reach a peak by the end of 2018.
	Yadavaran		The output rose from 50,000 b/d in December 2015 to 115,000 b/d in October 2016.
	Yaran		The crude production stood at 15,000 b/d in May 2016, and there was a twofold increase in outcomes since then until October.
Southern Oil Fields	EOR/IOR	Ahwaz, Aghajari, Kupal, Karanj	After four months of ban lifted, production in these fields jumped by 500,000 b/d to 2.7 million b/d.

Source: Post-Vienna: Prospects for Iran's oil production and exports

Table above describes the production status in two Iranian regions of oil fields – West Karun and Southern – after the international sanctions were decided to remove since January in 2016.

5.2.2 Crude oil export

Following the production growth, the country was also exporting more crude oil overseas after the longstanding ban removed. Iran pushed its crude oil sales to 1.5 million bpd at the beginning of 2016, and surged to nearly 2.5 million bpd in October 2016; this export strength roughly tripled the pace since late 2015 (Egan, 2016).

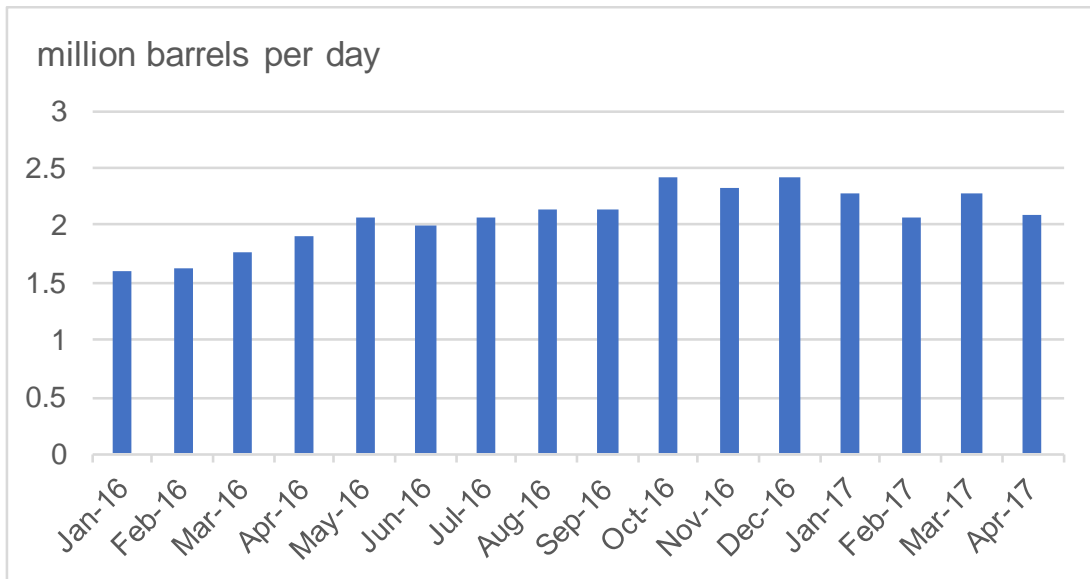


FIGURE 15. IRANIAN CRUDE OIL EXPORT FROM JANUARY 2016 TO APRIL 2017

Source: JodiOil

With the rise in exports, Iran may confront in exceed the oil production capacity because as we mentioned above, more than half of petroleum’s volumes were stockpiled in tankers offshore and onshore storage tank under sanctions. Since international entities declared to relief the sanctions on Iran, its stored crude oil was sold right away. A quick re-entering of Iran into the oversupplied market also led Iran deal with many difficulties; hence in order to lure the buyers participating into long term contracts, Iran offered some discounts. This action from Iran further increased its market share’s competition in the global market and impacted on Saudi Arabia, which did not agree on Iran’s ease sanctions, to be more hostile on pricing.

Since the easing of the embargo, the main buyers in Asia have kept purchasing the bulk of crude oil from Iran. China and India have still remained the top importers with 5.52 million bpd and 3.21 million bpd respectively in 2016. Meanwhile, South Korea (2.48 million bpd) has surpassed Japan (1.91 million bpd) to become the third largest traders. In Japan, some of the Japanese companies such as Marubeni, Sumitomo, Itochu and Kanematsu, which had halted to import crude oil from Iran under sanctions, was looking to resume imports. This would be a good signal for boosting Iran to return to the market successfully.

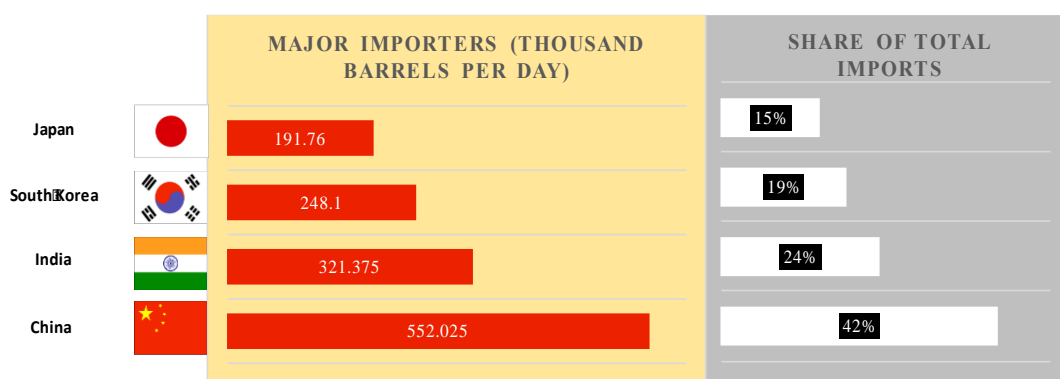


FIGURE 16. MAIN IRANIAN CRUDE OIL IMPORTERS IN 2016

Source: Middle East Institute

The only outstanding change in the destination of Iran's export has been that EU has started buying again Iran's crude oil for the first time since 2012. France's Total, Spain's Cepsa and Greece's Hellenic Petroleum were the three first companies in Europe booked Iran's crude oil in 2016. Besides, due to the relaxation of EU sanctions, Iran could find new European customers. For instance, Hungary's MOL was committed for the first time to purchase for 140,000 tonnes of Iran's heavy crude oil (PresstV, 2016).

Following the fact that main buyers increased their imports from Iran after the lifting of international sanctions, Iran's crude tankers could purchase for their insurance coverage since 2016. In January 2016, it was reported that NITC still has approximately 45 million barrels of crude oil in storage in the Persian Gulf. With the end of sanctions, NITC aimed to modernize its aging fleet and boosted this volume of stored oil to export to Europe and Asia.

5.2.3 Terms and transportation agreement

Traditionally, Iran used Cost, Insurance, and Freight⁵ (CIF) terms to sell its crude oil to EU consumers. In order to deliver crude oil to European customers via the East Suez SUMED pipeline's terminal, Iran needed to carry most of its crude oil through the Suez Canal. However, after the restriction was released, Saudi Arabia which holds one-half of stake in SUMED pipelines, sometimes forbid Iran to use this pipeline for discharging crude oil. Therefore, there were frequent challenges when NIOC wanted to hire this terminal to storage facilities. Accordingly, Iranian transportation method of crude oil exports was changed to Free On Board⁶ terms (FOB) to minimize Saudi Arab's involvement.

5.2.4 Foreign investment and new contract model

Unlike Mexico or Saudi Arab, which are major crude oil producers, Iran has a long history of depending on foreign investment in oil industry development so it is easier to attract overseas capital and technologies. Not surprisingly, some of the early remarks on the lifting of sanctions have speculated about the speed of the foreign investment's return to the oil sector. In fact, the end of sanctions would open up more

⁵ The seller is in charge of delivering the goods onboard at the port of shipment. Transport cost and insurance will be paid by seller. The buyer is responsible for all risks when the goods are onboard (UNDP, 2008).

⁶ The seller's responsibility is until the goods are loaded onboard. The buyer has to pay for all costs and is responsible for risks or damage of goods (UNDP, 2008)

potential investment opportunities for the IOCs as well as the other foreign investors, especially when the new Iran Petroleum Contract (IPC) contract was approved by Iran's government. After years of being restricted to approach to external technologies and expertise, Iran would need help from foreign investors for its upstream industry.

In line with the expansion of foreign investments, Iran also launched a new model of contract, ending a two-decade of "buyback" contracts. According to Iran's Constitution, foreign or private possession of natural resources, and the agreements on production-sharing are prohibited. Under this old contract system, IOCs did not allow to book reserves or take equity stakes in Iran's companies but they can join into contracts regarding to exploration and development via subsidiaries in Iran. Basically, the buyback contract has similar features to a service contract and the contractor or IOCs will be required to invest capital and knowledge for oil fields development. Once the all the process of field development is completed and the activities of production start, the project's operator returns to NIOC or the involved subsidiary. The IOCs are paid back for the costs of capital by oil sales revenue with the rates between 12% and 17% within five to seven years (EIA, 2014)

With the new model –IPC, Iran targeted to attract international oil companies by offering flexible price fluctuations and risks in investment. In addition, IOCs can book reserves under IPC, in spite of not owning fields, and can agree with NIOC in a joint venture or related subsidiaries in order to take part in oil activities' management. Regard to contract's time, the duration of IPC can be extended to 15-20 years or up to 25 years in some cases, and IPC allows longer cost's recovery after the first production. Finally, within the breach of new contract, Iran requires foreign investors together with Iran's oil companies to run the projects.

5.2.5 Estimated impact on global crude oil market

The suspension of international sanctions targeting on Iran's crude oil sector included an end to EU limitation on Iranian crude oil imports. According to our interviewees, it was estimated that Iran's plans to raise output and exports will affect the global oil market. They stated the immediate impact will be expected to come from Iranian floating storage, which means oversupplied crude oil for the market. Indeed, Iran added immediately one million bpd for its production and boosted almost 2 million bpd for crude exports in 2016. The following figure will reveal a closer view on global crude oil output from January 2016 to April 2017.

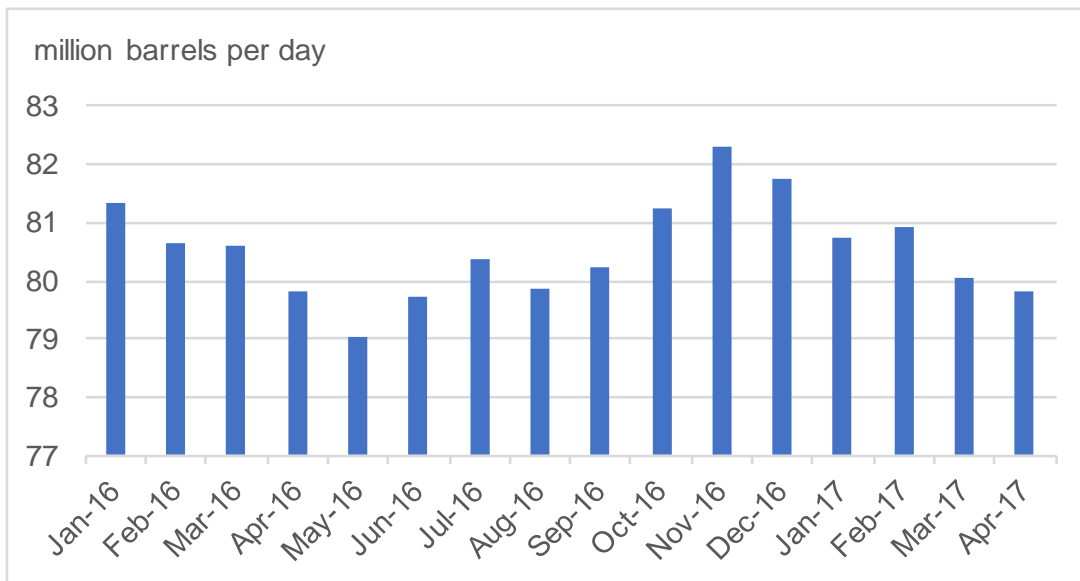


FIGURE 17. WORLD CRUDE OIL PRODUCTION FROM JANUARY 2016 TO APRIL 2017

Source: YChart

As it recorded, crude oil production worldwide in 2015 was 79.80 million bpd and rose by 1.54 million bpd in the first month of 2016. Although there was a fluctuation in production during 2016, crude output still reached nearly 82 million bpd at the end of this period.

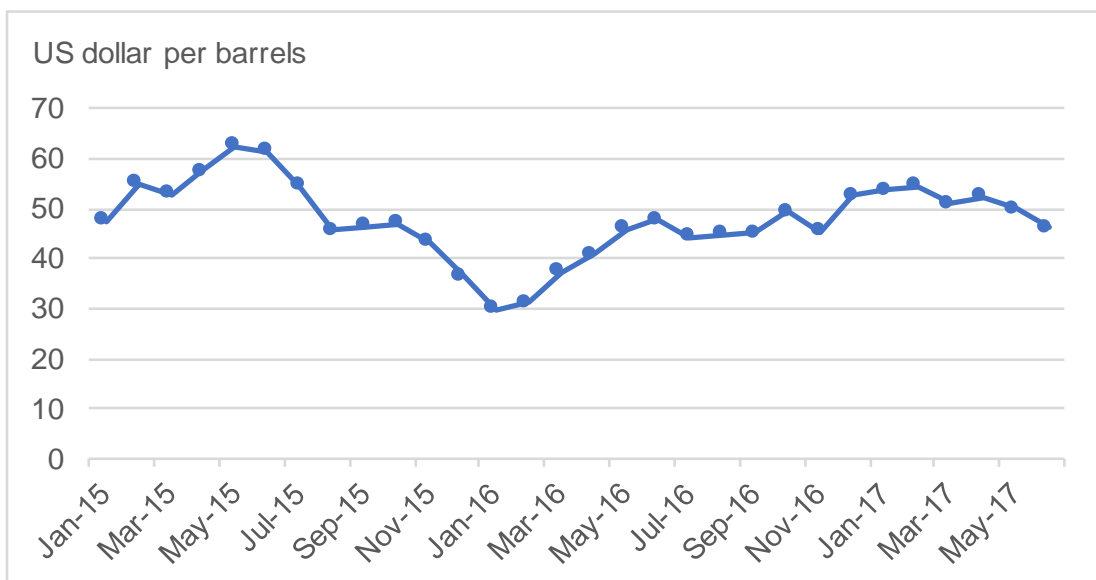


FIGURE 18. AVERAGE CRUDE OIL PRICES OF THREE SPOT PRICES: DATED BRENT, WEST TEXAS INTERMEDIATE, AND THE DUBAI FATEH

Source: Indexmundi

In addition to imbalance market, Iran’s full return to the crude oil market would lead to downward pressure on crude oil prices. In January 2016, the average crude oil prices

hit the bottom at \$29.92 per barrels (Figure 18), which was the lowest price since 2003. According to the report of SVB Energy International, the prospect of flooding the market from Iran with more crude oil led Brent Crude price dipped to \$27.67 per barrel. US crude oil price also fell to \$28.64 per barrel. The sharp fall in crude oil prices suffered revenue shortfalls in many oil exporting nations such as Venezuela, Saudi Arab or North America, which are the world largest oil exporters.

5.3. The future outlook for oil market in Iran

To conclude this chapter, we reflect about the future prospect of Iranian crude oil production based on the other researcher's studies and our analysis. First of all, according to the group of four researchers who are belong to Stanford Iran 2040 project (Azadi, Dehghanpour, Sohrabi and Madani), Iranian crude oil production will uplift sequentially until the middle of next decade. Specifically, the production will first increase 4 million bpd by 2020 and further reach 4.4 million before 2030. By running surrogate model, they forecast that the oil fields' production capacity may slide from 3.7 million bpd to 2.5 million bpd by 2040. Besides, greenfields (undeveloped fields) will have daily production capacity which may increase from 90,000 bpd to 1 million bpd by 2027, but then decrease at annual rates of 27,000 bpd to produce 650,000 bpd in 2040. In terms of oil reserves, it has likely been discovered since 2016 and will probably go online after 10 years. They also estimate that the undiscovered reserves may contribute approximately 700,000 bpd in 2040. Finally, they predict that Iran will begin to materialize the recovery of crude oil through the implementation of EOR methods from the middle of the next decade, which result in an improvement in oil output to nearly 500,000 bpd by 2040. As a result of an upward in oil production, the annual gross value of Iranian crude is projected by applying the EIA'S baseline crude price projections that Iran will reach its 2011/12 record value of \$150 billion in the half of the next decade.

However, based on our analysis and qualitative results, even though there are some significant impacts on crude oil sector after sanctions suspended, the effect only can exist for short term. In the long term, we believe Iran will not be able to become a primary player in global crude oil market with price influence. Firstly, with the production level has been supplied to the market around 4-4.5 million bpd over the next few years, we reckon it is not enough for Iran to interrupt the world oil market. Iran at least needs to achieve closer to the production level of Saudi Arabia which is the number one crude oil producer in OPEC. Secondly, as a key producer, Saudi Arabia has been keeping to produce at the historical level. As long as this country supplies with high volumes of production, Iran cannot determine the crude price on the market in the future.

5.4 Expectations and suggestion for Iran's crude oil

5.4.1 Expectation

Even though we have been assumed that the crisis on Iranian oil sector caused by international sanctions, the fundamental problem has been the result of political decisions from the Iranian government, especially issues relating to nuclear and missile activities. We sincerely expect in the near future; Iran's government can tackle the problems regarding to political relations with other countries, especially with the US.

5.4.2 Suggestion for Iranian government and oil companies

There is no doubt that the decision from the government in Iran could affect and smooth the path of oil sector structure as well as performance. In order to develop Iran's oil industry, we would like to suggest some recommendation for both Iranian

government and oil companies based on our research's results.

First and foremost, after a long period of being frozen by the international sanctions, probably Iran will become a new comer in this changeable market. The trade policy or the oil structure may be obsolete; therefore, Iran's government needs to redefine its oil sector's vision and outlook in line with the realities of the world market. Another important issue that Iranian authorities ought to notice is about technology catch-up. As previously mentioned, Iran has returned to the global oil market and finding a way to re-enter this market is not easy with Iran's condition now. According to Abbaszadeh and colleagues, crude oil production can reach 5.2 million bpd in the future due to the advancement of technologies. Therefore, it is necessary for Iran's government to equip up to date technologies for developing new old fields to attract huge capital investment from foreign countries. Furthermore, more cooperation between academic and research centre should also be a goal of the Iranian government. Nowadays, Iran is still the lack of appropriate research and modern facilities as well as adequate institutions for researchers or students to investigate different factors of the oil industry. Even though NIOC owns its research centre and there are also petroleum courses in several Iranian universities, no clear connection between the oil sector and higher education has been established. The more cooperation between these two departments, the more opportunities will be facilitated for the growth in oil industry.

With regard to oil companies, considering about Iranian crude oil quality is an affair that they should concentrate on it. International sanctions had the negative impact on not only Iran but also on Western economies. In fact, due to sanctions, Western companies lost the market in Iran, they had to look for another crude oil markets instead of Iranian market for their demands. However, Iran has had a high quality of crude oil that not many countries have, so the oil companies in Iran should exploit this advantage to rebuild their old oil fields. By doing that, the oil quality will be improved more than before.

5.5 Other variables influencing on Iran's crude oil activities

Generally, the end of international sanctions has caused almost the changes within Iranian crude oil sector. However, there are still three other potential variables may have an impact on Iran's oil.

The first factor is its operational problem. Based on a research paper of Paul Stevens in 2015, Iran's oil sector began to be politicized and unorganised. Since the late 1990s, Iran has restructured the oil sector, aiming for a privatisation program. Nevertheless, the decision to nominate a separate head of NIOC and divide the company into more than 100 operating units has made the responsibilities more complex. Meanwhile, the policy towards oil industry is against by different political. As a result, this hinders the Iranian oil's operation and leads to an effect on Iran's oil.

Secondly, as the years passed, the Chinese economy has exhibited extremely severe signs, suggesting that demand growth may be considerably weakened. China is the biggest importer of crude oil of Iran and the world. The slowdown in Chinese economy means less demand for crude oil than before; thus, a decrease in China's imports may be a huge loss for Iran's crude oil.

Finally, the last main event that could cause a significant shake-up on Iran's oil sector is Iranian election. The outcome of this event might have an influence on Iran's oil production level, prices and foreign investment. Besides, crude oil export in Iran will

also be impacted in case new administration decides to cancel or weaken the nuclear deal.

Chapter 6 Conclusion

The last chapter will summarize the result of this research. There are also some shortcomings and the methods of this research as well as the recommendation for further studies regarding to this topic and major of study.

6.1. Key findings

In the case of Iran, with support from our interviewees, the case studies and other literature research, we conclude that the impacts of international measures are significant for Iran's crude oil industry for a long time. Under severe sanctions, especially the extended sanctions from 2011, Iran's oil production decreased rapidly from 4 million bpd in 2011 to nearly 3.1 million bpd in 2013, that led Iran drop to third place in largest crude oil producers among OPEC members in 2012. A downfall in production also resulted in a slump of exports. Specifically, traditional buyers as China, India, Japan and South Korea phased out their payment in Iranian crude oil completely. In terms of EU market, European buyers at first cut their intake after strengthening sanctions and then stop purchasing for Iran's oil, which made Iran lose its market share in EU seriously. Also because of these obstacles, crude oil reserve in Iran witnessed a downward trend and besides, the shipment had difficulties since the Protection and Indemnity (P&I) club stopped providing insurance coverage for any tankers that carried Iranian crude oil. This event in Iran created series of negative impact on global oil prices.

When Iran announced to be eased the punishment by the Western community in 2016, Iran's crude oil sector shown notable positive outlook. There was an increase Iranian oil production but it was not remarkable due to its large inventory in pre-sanctions. During the first quarter of 2016, Iran's oil production rose insignificantly compared to the last quarter over the last quarter. We estimated that Iran continues to sell more crude to existing Asian consumers but is also likely to expand trade routes with EU buyers. In addition, in post-sanctions, the term in transportation was shifted from CIF to FOB and "buyback" agreement was changed to IPC. In this sense, Iran could be more attractive to foreign investors. Finally, the insurance issue would be released that helped Iran take opportunities to enter EU market easily.

We found that Iran will continue to grow crude oil production over the next 20 years. However, based on our analysis, we believe that the scenario of being an actor with price influence is unlikely feasible. This is because an improvement in production now is not enough for Iran to interfere the global market, and a strong competition came from Saudi Arabia.

6.2. Research limitations

The aim of this thesis is gaining in-depth comprehension about underlying reasons and motivations, we conducted qualitative research. Although the research purpose was reached, there were still some unavoidable limitations. In this section, we would like to discuss the problem that we dealt with during this research.

First and foremost, the issue in this topic just occurred last year so there are not many academic studies about this topic. Also, accessing the data required is another limitation of this thesis because crude oil database is not published completely, especially Iran crude oil prices.

Secondly, this qualitative research is time-consuming because we had to conduct the interviews and the time was limited. Furthermore, our respondents are working so

most of them are busy. As a result, it took time for their replies; even some interviewees responded after several weeks.

Furthermore, the results and analysis were based on personal experience and knowledge from our respondents, hence it was a little complicated when the answers were different and the conclusion was not consistent. From that, we were under difficult situations to explain the difference in quantity as well as the quality of obtained information.

Finally, due to a lack of experience in conducting researches and doing academic papers, our scope, and depth of this topic is compromised in comparison with experienced scholars.

6.3. Recommendation for further study

As this research concerns about current issues relating to Iran's position in the international section and its effects on the key sector, there are endless guides that this research can be investigated further. Firstly, this research has only focused on fundamental petroleum perspectives namely production, export, traders and relatively narrow shipment's terms or contract. Meanwhile, tanker issue also plays an undeniable role in oil industry so it would be interesting for the other studies that have the same topic or breach of research to be done for tanker's factors. Tanker market's aspects could be time charter rates, VLCC contract and earnings or freight rate.

In addition, it may be valuable to analyse and compare crude oil sector with the other industries banned namely agricultural field to see more about how sanctions affect Iran's crude oil. Under sanctions, not only crude oil but also the other sectors also experience a severe period. Therefore, further studies may want to enlarge their scope of research.

The main methodology of this research is qualitative approach by interviews and case studies because there were not many peer-reviewed articles analysed before. Nevertheless, as some limitations considered in section 6.2, we suggest a quantitative analysis. For example, in a further study, an econometric model can be applied to predict the future of oil production and prices. Or a GSIM model can also be a good tool to have a deeper understanding about trade flows between Iran and other countries.

In closing, we also recommend that another aspect of further research can examine from law or political perspective. These features can give a deeper comprehension on more factors that significantly influence on Iran's crude oil aside.

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