

The Impact of Natural Gas and Oil for the Economy of Azerbaijan

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ABSTRACT

This thesis examines the role of oil and natural gas resources in the world economy and the impact of natural gas and oil trade for the economy of Azerbaijan. Because of increasing demand of natural gas and oil supply are one of the most important and strategic energy security issues for the countries who don't have their own energy sources. They inevitably became huge importers of natural gas and oil. Region of Caspian is one of the richest regions in terms of natural gas and oil, has always been important exporters for European Union and Turkey.

Azerbaijan has been an important exporter of oil and natural gas which is located in the Western Caspian Region, as the need for natural gas and oil increases, Azerbaijan became significantly important for European Union countries and also for Turkey, and they are now constructing better relations, creating new projects for the new long-term plans.

Southern Gas Corridor (SGC hereafter), is a result of good relations with huge importers of Azerbaijan's natural gas. The SGC is an attempt of European commission for a gas supply route from Caspian to Middle East and to Europe. The aim of Southern Gas Corridor is to decrease EU's dependency on Russian gas and to diversify the gas routes in order to assure the reliability of gas supply as well as to safeguard the gas delivery for the next decades. SGC has changed the monopolistic power of Russia and led Azerbaijan and Turkey to be the game player in natural gas trade.

Keywords: oil and gas sector, economic development, Azerbaijan, Turkey, EU.

ÖZ

Bu tez, doğal gaz ve petrol kaynaklarının dünya ekonomisindeki rolünü ve doğalgaz ve petrol ticaretinin Azerbaycan ekonomisine etkisini incelemektedir. Artan doğalgaz talebi nedeniyle petrol arzı, kendi enerji kaynaklarına sahip olmayan ülkeler için önemli ve stratejik enerji güvenliği konularından biridir. Kaçınılmaz olarak doğalgaz ve petrolün büyük ithalatçıları haline geldiler. Doğalgaz ve petrol açısından en zengin bölgelerden biri olan Hazar Bölgesi, Avrupa Birliği ve Türkiye için her zaman önemli ihracatçıları olmuştur.

Azerbaycan, Batı Hazar Bölgesi'nde yer alan önemli bir doğalgaz ve petrol ihracatçısı olmuştur, doğalgaza ve petrole olan ihtiyaç arttıkça, Azerbaycan Avrupa Birliği ülkeleri ve Türkiye için de önemli hale gelmiştir ve giderek daha iyi ilişkiler inşa etmektedir , yeni uzun vadeli planlar için yeni projeler yaratmak önemli hale gelmiştir.

Güney Gaz Koridoru (diğer adıyla SGC), Azerbaycan doğalgazının büyük ithalatçılarıyla iyi ilişkilerin bir sonucudur. Güney Gaz Koridoru, Avrupa Komisyonu'nun Hazar'dan Ortadoğu'ya ve Avrupa'ya gaz tedarik güzergahı oluşturma girişimidir. Güney Gaz Koridoru'nun amacı, AB'nin Rus gazına olan bağımlılığını azaltmak ve önümüzdeki yıllar içinde gaz arzının güvenilirliğini sağlamak ve aynı zamanda gaz dağıtımını güvence altına almak için gaz yollarını çeşitlendirmektir.

Anahtar Kelimeler: petrol ve doğalgaz sektörü, ekonomik kalkınma, Azerbaycan, Türkiye, AB.

*To my mom and beloved ones,
Who always encouraged me to be better and successful.
The reason of what I became today...
Thanks for your amazing support and endless love.*

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I wish to show my appreciation to the technical and support staff in the Department of Economics of Eastern Mediterranean University, and the members of the department who helped me to finalize my thesis.

PREFACE

This thesis is a final work for the degree of Master of Science in Faculty of Business and Economics, Eastern Mediterranean University titled “The Impact of Natural gas and Oil for the Economy of Azerbaijan.”

This thesis will provide information regarding the new NG findings and elaborate more in depth how economy is affected from natural gas reserves in Azerbaijan.

It has been a great opportunity for me to be able to write this thesis at Eastern Mediterranean University and have had amazing experiences during my academic career.

I hope that this project will be beneficial for my next articles and for the people who interested in this topic.

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LIST OF ABBREVIATIONS

ACG	Azeri-Chirag and Gunashli
AIOC	Azerbaijan International Operating Company
AMOCO	American Oil Company
ARDL	Autoregressive Distributed Lag Bound Test
Bcm	billion cubic meters
BP	British Petroleum
BTC	Baku-Tbilisi-Ceyhan pipeline
CIS	Commonwealth of Independent States
DOLS	Dynamic Ordinary Linear Squares
EEZ	Exclusive Economic Zone
EIA	Energy Information Administration (at the US Department of Energy)
EIU	Economic Intelligence Unit
EU	European Union
FMDLS	Fully Modified Ordinary Least Squares
GDP	Gross Domestic Product
IEA	International Energy Agency
NG	Natural Gas
OECD	Organization for Economic Cooperation and Development
OPEC	Organization of Petroleum Exporting Countries
SCP	South Caucasus Pipeline
SGC	Southern Gas Corridor
SOCAR	State Oil Company of Azerbaijan Republic

TANAP	Trans Anatolian Natural Gas Pipeline
TAP	Trans Adriatic Pipeline
TPAO	Turkish Petroleum Corporation
UNOCAL	Union Oil Company of California
USSR	Union of Soviet Socialist Republics

Chapter 1

INTRODUCTION

1.1 General

Energy is the main component of economic development. Its continuous availability is necessary to support the expansion and development of the global economy. It is widely believed that NG and oil will continue to be the main energy sources in the next 30 years. The continuous growth of the global economy has raised the demand for oil. This has prompted oil producers to explore new oil fields. The collapse of the USSR (The Union of Soviet Socialist Republics) created new opportunities for major gas companies in the Caspian region. Projects have been developed for the exploitation of various regional resources. Various collaborations have been established at various levels. The energy consumption and the infrastructure of a country are very important factors which affect its socio-economic development. Inadequate infrastructure and lack of seaports were some of the factors forced Azerbaijan, which enables the country to develop its national economy, to cooperate with other developed countries for possible energy trade.

1.2 Thesis Objective

The main objective of this study is to analyze the NG and oil consumption in the economy of Azerbaijan. The study will examine the importance of the natural gas (NG hereafter) and oil sector in the economic growth and export of Azerbaijan. Throughout this study we are aiming to show competition of all nations through energy resources,

the power of developed countries and energy companies owned by developed countries.

1.3 Thesis Organization

Chapter 2 gives information about the history of NG and oil, also shows the importance of NG and oil reserves, consumption, demand and production in the world.

Chapter 3 shows the companies who are the energy majors actively engaged in international gas trade. Additionally, we will focus on the political economy as well as economic geography which have significant effects on the pricing of NG and oil, in particular the EU region with enormous energy imports.

Chapter 4 explains the pipeline routes to Europe, Regional Energy Model and Energy Dependency of European Union.

Chapter 5 is the Conclusion and Policy Recommendations.

Chapter 2

AN ANALYSIS OF NG AND OIL RESOURCES IN AZERBAIJAN, CASPIAN SEA AND REST OF THE WORLD

2.1 Oil Reserves

The petroleum industry covers the extraction of petroleum and its use for different purposes. The oil extracted from underground is shipped to refineries to undergo different processing processes. Due to its chemical properties, there are hydrocarbons that contain the three states of the substance obtained at different temperatures, solid, liquid and gas.

Oil has been used as a strong weapon against the other countries in economic and political lives of the world's history. After Azerbaijan's disintegration from the Soviet Union, oil has become an important asset for the wealth and the economic independence of Azerbaijan.

2.2 History of Oil in Azerbaijan

Republic of Azerbaijan is one of the oldest oil-producing countries in the world. The Absheron Peninsula and Baku have been known as historical oil places. They are located in eastern Azerbaijan, flanked by the Caspian Sea. In 1846 – 1848, the first modern oil wells were drilled on the Absheron Peninsula by Russian engineer Vasily Semyonov. The first oil refinery was constructed in Baku in 1859, 15 oil refineries

operated in 1867. Russia's first oil pipeline was constructed in 1878, linking the Balakhani field to the Baku oil refinery. In 1898, the total length of all pipelines connecting to Baku oil refineries with oil fields was 230 kilometers, and these pipelines transported 1 million tons of oil per year. Despite the country's long history of exploitation, Azerbaijan has a large oil reserve base. The country's remaining oil reserves are estimated to be 3.3 billion barrels (EIU, 1999).

Seismic discoveries in the Azeri part of the Caspian Sea have identified over 140 offshore structures that have the potential to produce petroleum. These areas are located in the southern part of the country's oil and gas sector. Preliminary indicators show reserves at these 140 fields as 85 to 100 billion barrels of recoverable oil that can be sustained at depths of up to 800 meters. (Chipman, 1998).

2.2.1 The Contract of the Century

One of the most important consortiums that SOCAR has signed internationally named AIOC (Azerbaijan International Operating Company). This consortium established in 1995. On September 20, 1994, SOCAR and the Western Oil Consortium signed an agreement for the development of three oil fields in Azerbaijan. The agreement was dubbed the "Contract of the Century" by the reporters. SOCAR is a state-owned company that conducts oil and NG exploration and development activities in the Republic of Azerbaijan. Since 1994, SOCAR has signed 21 important oil agreements with consortia of foreign oil companies with a total investment of 60 billion dollars, (Azerbaijan International, 2003).

AIOC (Azerbaijan International Operating Company) aims to develop and produce Azerbaijan's oil. Azeri, Chirag and the Deep Water Gunashli Field. The consortium signed among SOCAR (State Oil Company of the Azerbaijan Republic) and other

international companies. Eleven international oil companies signed a \$7.4 billion agreement (SOCAR, AMOCO, BP, McDermott, Lukoil, Statoil, UNOCAL, Ramco, Delta, TPAO, Pennzoil) 7 countries are represented (Azerbaijan, USA, Turkey, Russia, Norway, United Kingdom, Saudi Arabia) parties as contractors. The Contract of the Century showed its success with other 26 contracts, 41 oil companies from 19 countries.

SOCAR and co-venturers signed Azeri, Chirag and Deep Water Gunashli Production Sharing Agreement on September 14, 2017 and prolonged the development of this field until 2050.

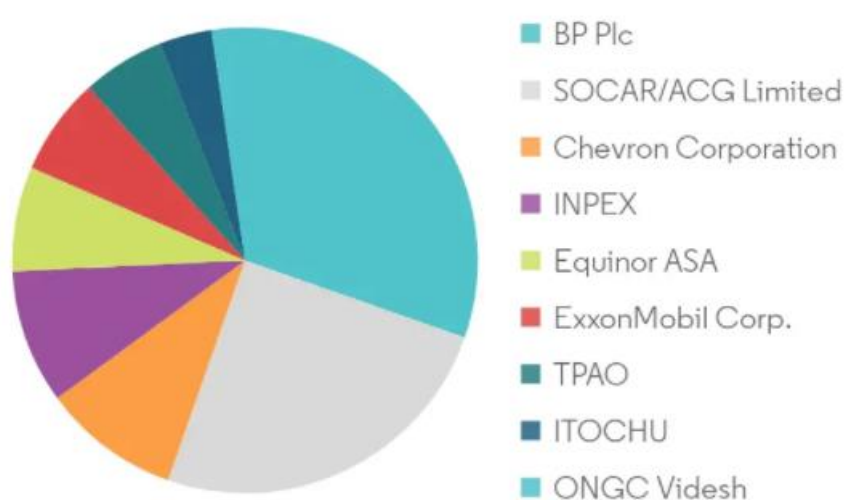


Figure 2. 1: The ACG Field Share of Interest (%), by Company
Source: SOCAR, 2019

The ACG (Azeri, Chirag and Gunashli) Fields were initially estimated to have 500 million tons of oil, but the final assessment is over 1 billion tons. Consortium and their present shares of the companies; BP (United Kingdom) 35.8%, SOCAR (Azerbaijan) 11.6%, Chevron (USA) 11.3%, Impex (Japan) 11.0%, Statoil (Norway) 8.6%, ExxonMobil (USA) 8.0%, TPAO (Turkey) 6.8%, Itochu (Japan) 4.3%, ONGC Videsh

Limited (India) 4.3% The Contract of the Century pointed to the success of oil strategy in Azerbaijan, with this project Azerbaijan has started a new period in the history of Azerbaijan and this situation increases the GDP Growth also guarantees the economic and political security, this leads the new job opportunities, investments and welfare for the country.

2.3 NG Resources

NG is a mix of gases which are rich in hydrocarbons. NG is a fossil fuel that is so important by the countries' economic and political benefits, but to use the NG resources, countries need a great and developed economies.

Energy is not only important as a production and consumption material. It is also a determining factor for countries and economies. Energy is the most effective factor in raising the level of development and welfare as well as in the economic and social development of countries. Tuncer and Dilekçi (2018) noted that there is a significant relationship between oil consumption and economic growth of 28 OECD countries between 1980 and 2013. They also stated that there is long-run equilibrium (cointegration) relationship between these oil consumptions and economic growth.

2.4 Oil - NG Production and Consumption in Azerbaijan

NG and oil as energy sources are the strategic raw materials of today's world economy. If there is a deficiency in the supply of these two resources, it is clear that the economies of the countries and therefore the world economy will be affected. As a primary energy source, petroleum has been one of the basic elements that have been consumed in parallel with the development of industry in the world since the end of the 19th century and accelerated its development. With its much wider usage area in the 20th century, it is indispensable for human life today. Research shows that oil will

continue to be the most important energy source in the medium term. In addition to oil, NG is an easy and clean energy source to transport, making the use of NG increasingly widespread. The proximity of NG to oil in terms of heat energy per unit mass also increases its market value.

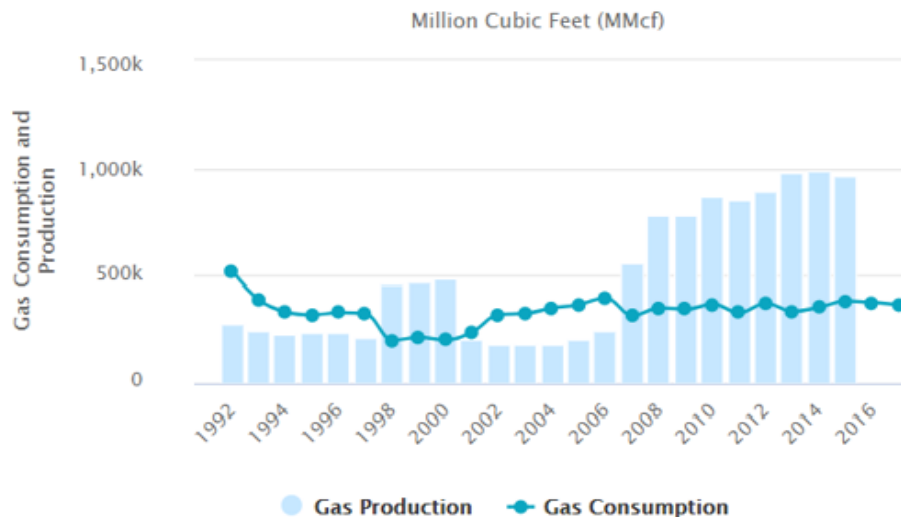


Figure 2. 2: NG Production and Consumption in Azerbaijan (1992-2016)
Source: Statistical Review of World Energy, BP (2017)

After Soviet Russia's collapse, Azerbaijan has started to gain power over energy resources. Figure 2.2 shows Azerbaijan's total gas balance. Starting from 1992, Azerbaijan's relationship with other countries and with major companies became stronger because they needed economic power to increase their GDP as a new country. This ideology led them to explore NG and oil through finding major companies' partnership. As Figure 2.2 indicates, NG production and consumption increased until 2000 then decreased and stayed constant until 2006. Even 2008 global economic Crisis, Azerbaijan's NG production continued to increase.

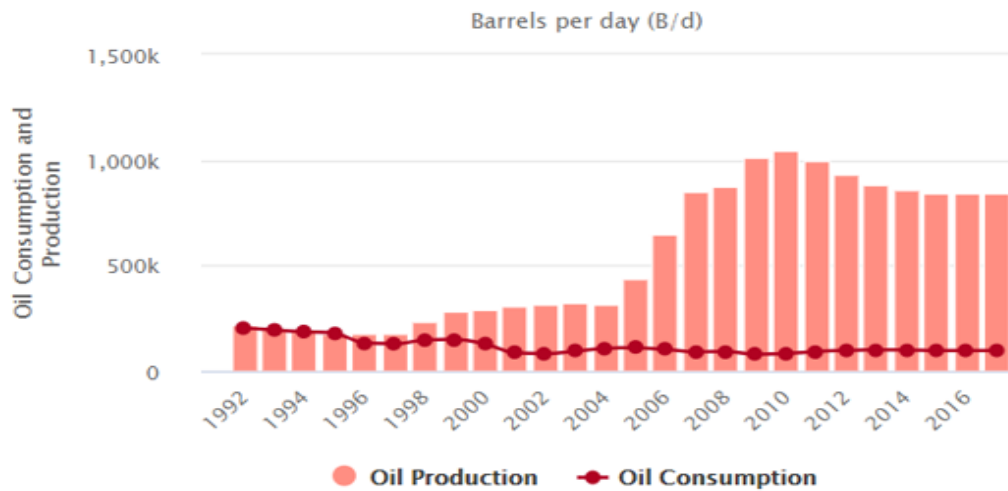


Figure 2. 3: Oil Production and Consumption in Azerbaijan (1992-2016)
Source: Statistical Review of World Energy, BP (2017)

After Soviet Russia's disintegration, Azerbaijan has started to gain power over energy resources which is illustrated by Figure 2.3. The Figure shows that oil production started to increase from 1998 onwards and spiked at 2010. However, oil consumption throughout the entire period stayed relatively unchanged. Starting from 1992, Azerbaijan's relationship with other countries and with major companies became stronger because they needed economic power to increase their GDP as a new country. This ideology led them to explore oil resources through finding major companies' partnership and EU's support. With new explorations and consortiums in 2006, Baku-Tbilisi Ceyhan Pipeline started to transport oil from Baku to Georgia then Turkey, with this pipeline Azerbaijan's oil production has started to increase. Even 2008 global economic crisis, oil production was not affected.

2.5 Oil – NG Production in Caspian Region

The Caspian region has a geographical location between the Middle East, Asia, and the Caucasus, not connected to the open seas. Azerbaijan, Kazakhstan, Iran, Russia, and Turkmenistan are located on the shores of the Caspian Sea. Turkmenistan, Azerbaijan and Kazakhstan are working to continue their activities independently from

other countries, especially to use their natural resources effectively and efficiently (Aydın, N.Z., 2012). In this way, the country's dependency on foreign sources can be reduced, democratic conditions can be improved, and steps can be taken to advance the existing conditions. There are disagreements among the countries in the Caspian region on how to share the Caspian Sea, in another words there is a dispute to have their own Exclusive Economic Zone (EEZ) due to overlapping problem. There are also geopolitical and legal disputes among them regarding the share of the Caspian Sea, the EEZ problem has not been resolved yet. In August 2018, all five coastal states have signed an accord to solve the problem multilaterally, yet they are in stalemate position. For this reason, the amount of NG and oil has not been clarified. Sharing the resources is a problem, how the resources will be transferred to another country is another problem. This is because of the regional deadlock of the sea and surely region does not have any access to the open seas.



Figure 2. 4: Map of Caspian Sea
Source: Nations Online Project

Russia, one of the strongest and richest countries of the region, is trying to reach its former hegemonic power after the collapse of the USSR and is taking political steps to establish its former dominance over the region and dominate the region. Russia makes its policies mainly on NG and Petroleum energy. Countries other than Iran and Russia are trying to establish their structures and they do not have the necessary knowledge and also the appropriate technologies to determine their energy reserves. For these reasons, exact numbers cannot be given, but data from satellites can be used. There are loads of reserves in the region based on the satellite data (Yüce, Ç.K, 2006).



Figure 2. 5: Major NG- Oil export routes from Caspian basin
Sources: U.S Energy Information Administration, HIS EDIN, Eastern Bloc Energy, Rigzone, Rysad Energy

Considering BP's statements regarding its 2019 Energy forecast, the total reserves of the five countries that make up the Caspian region are approximately 300 billion barrels. However, Iran has not carried out any study on its reserves in this region. Due to the lack of permanent solutions for the status problems of the Caspian and also the fact that it has 155.6 billion barrels of reserves outside the region, it did not focus on production activities for the region. While Iran has 9% of the world's reserves, the oil reserves of the Commonwealth of Independent States correspond to 8.4% of the overall capacity. The total reserves of the Caspian region are close to the reserves of Saudi Arabia. In the light of these data, the importance of the region for the energy markets emerges. This explains the importance given to the region for other countries that need energy. Reserve rates show that the region will be important in the future,

especially for regions whose reserves are at the stage of depletion, although not as much as the Middle East in the near future. Considering the increase in oil prices per barrel due to the depletion of reserves, the Region will become even more critical for world energy markets. This situation reveals the necessity of making strategic plans in terms of NG and oil exports.

The reserves of the CIS (Commonwealth of Independent States), which were 121.1 billion barrels in 1998, were declared as 144.7 billion barrels in 2019 with the detection of new fields. The country with the highest reserves in the Commonwealth of Independent States is Russia, due to the size of its geography and the large amount of on-site reserves (106.2 billion barrels). Based on the newly independent countries, the country with the highest reserves is Kazakhstan (30 billion barrels). According to 2019 data, Kazakhstan's oil reserves constitute 1.7% of the world's reserves. Azerbaijan, the country with the highest oil reserves in the region after Kazakhstan, has 0.4% of the world's reserves (7 billion tons of barrels). Turkmenistan is the country with the least oil resources in the region with 0.6 billion barrels of oil reserves. (Table 2.1)

Table 2. 1: Proved Oil Reserves in Caspian Basin (Billion Barrels)

Countries	Proved Oil Reserves (billion barrels)	% Share of Total
Kazakhstan	30	1.7
Azerbaijan	7	0.4
Turkmenistan	0.6	*
Iran	155.6	9
Russia	107.2	6.2

Source: BP, Statistical Review of World Energy, 2020.

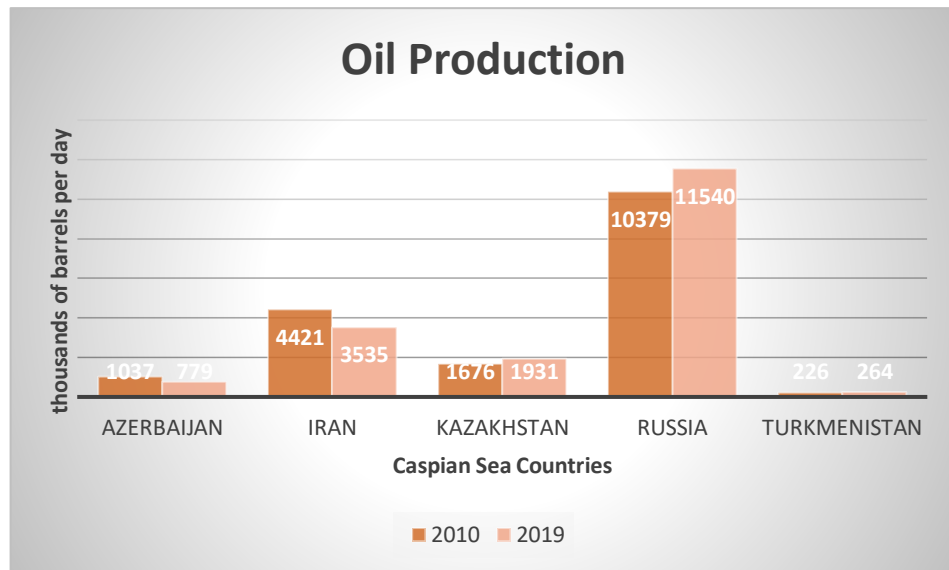


Figure 2. 6: Caspian Sea Countries Oil Consumption
Source: Author's own work

Russia, aiming to maintain its dominance in the region; European countries that do not want to be dependent on Russia's energy monopoly, but are also dependent on foreign sources because they do not have their own energy resources. The USA, which is trying to maintain its position as the world leader, and whose energy imports are around 13.9% even though it has energy resources; Turkey, which is poor in terms of hydrocarbon energy types and wants to be a game player in the region uses its geopolitical advantages; and finally, China, which has 23.5% of the world's energy consumption, focuses its energy policies on the Caspian region (Çınar B., 2008).

Table 2. 2: Caspian Sea Countries NG and Oil Production

Country	Oil production (thousands of barrels per day)		Natural gas production (billion cubic meters)	
	2010	2019	2010	2019
Azerbaijan	1037	779	16.3	24.3
Iran	4421	3535	143.9	244.2
Kazakhstan	1676	1931	20.4	23.4
Russia	10379	11540	598.4	679.0
Turkmenistan	226	264	40.1	63.2
Total	17739	1949	819.1	1070.2

Sources: BP, Statistical Review of World Energy, 2020

As the table indicates that between 2010 and 2019, Azerbaijan's oil production decreased while NG production increased. Russia has a huge power of NG and oil in Caspian Region, variables shows that large amount of production made in Iran after Russia, but during these times the SGC (Southern Gas Corridor) wasn't transporting Azerbaijan's NG. The SGC will change the variables in the near future, Azerbaijan is gaining strength in the Caspian Region with its strong relations with Europe.

Table 2. 3: Caspian Sea Countries NG and Oil Consumption

Country	Oil consumption (thousands of barrels per day)		Natural gas consumption (billion cubic meters)	
	2010	2019	2010	2019
Azerbaijan	72	108	8.1	11.8
Iran	1788	2018	144.4	223.6
Kazakhstan	211	353	11	17.9
Russia	2878	3317	423.9	444.3
Turkmenistan	118	162	18.3	31.5
Total	5067	5958	605.7	729.1

Sources: BP, Statistical Review of World Energy, 2020

Table 2.3 shows the quantities of NG and oil consumption in Caspian Region from 2010 to 2019. An important conclusion that can be drawn from the table is that the amount of oil consumption in Caspian Region has increased by nearly 18%, also the amount of NG consumption in Caspian Region has increased by nearly 20% in the last decade.

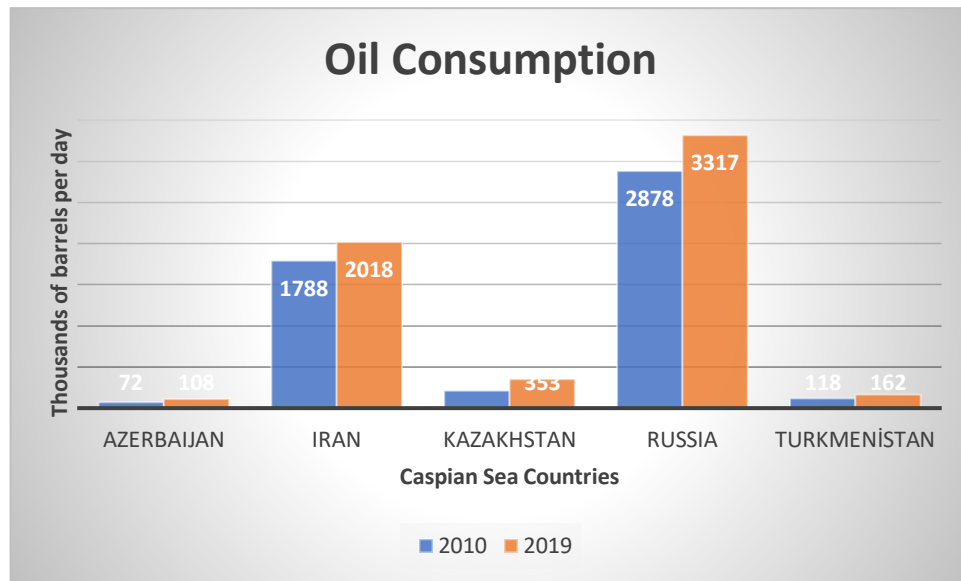


Figure 2. 7: Caspian Sea Countries Oil Consumption
Source: Author's own work

2.6 Political and Economic Movements of the Caspian Countries

2.6.1 Azerbaijan

Azerbaijan, the most active coastal country in the Caspian Sea, has become the new economic and political center of the region after the collapse of the USSR. While Azerbaijan has come to the fore especially by attracting Western capital to the energy resources in the region, it has also been in a dominant position with Russia in status discussions. Initially, Azerbaijan described the Caspian as a "border lake". Therefore, the Caspian Sea should be divided into national sectors and each country should have full dominance in its sector. This view is important in terms of creating a more favorable environment for Azerbaijan to achieve its goals in the region. Later, Azerbaijan changed its policy after Russia and Iran insisted on sharing the resources of the Caspian with the riparian countries. The new policy is in line with the division of the Caspian Sea into territorial waters and EEZ (exclusive economic zones). As a result of the three-day negotiations in Almaty on May 15, 2003, Azerbaijan, Russia and Kazakhstan agreed on the sharing of natural resources in the Caspian Sea.

According to the signed agreement, it was decided to leave 18% of the Caspian Sea coastline to Azerbaijan, 19% to Russia and 27% to Kazakhstan, and the borders on the seabed were determined in detail (Yüce, Ç.K., 2006). After signing August 2018 Caspian Accord, the resumption of talks was promising, so far nothing has been resolved yet.

2.6.2 Iran

Iran does not make any valid and sustained proposal for the Caspian Sea's legal status. The point that Iran is trying to bring to the fore is the idea that NG and oil works carried out here without determining the status of the Caspian are illegal. Iran also stated that it does not recognize the bilateral agreements between the Caspian Sea coast countries. Azerbaijan is one of the countries where Iran conducts status discussions in the Caspian. This is because Iran considers the problem as political rather than economic. Iran wants to prevent oil deals in the region that will contribute significantly to the development of Azerbaijan and continues its uncompromising stance for this (Güler, M., 2007). The biggest concern of Iran, which does not want foreign powers to come to the Caspian, is the growing US and Western influence in the region. Because of this situation, Iran feels that it is surrounded and thinks that it cannot get the necessary share from the Caspian Sea. Iran is not satisfied with the foreign policies of Azerbaijan, which it considers the biggest reason to discomfort Azerbaijan on every occasion through diplomatic channels. Iran wants to gain a strategic advantage in the region by expanding its borders in the Caspian Sea towards the middle of the sea.

2.6.3 Kazakhstan

Kazakhstan is the country with the largest coastline in the Caspian Sea. Kazakhstan, which tries to stay out of the legal status and sharing discussions, does not find the 20% equal sharing view proposed by Iran realistic and definitely does not accept it.

Since the shares of all riparian countries except Kazakhstan are below 20%, Kazakhstan will lose the most in equal sharing. In this regard, it actively supports Azerbaijan, which shows the greatest resistance to Iran, in the background. Kazakhstan and Azerbaijan are allies on the Caspian Sea's legal status.

The situation of Kazakhstan is more sensitive than the situation of Azerbaijan and Turkmenistan. The country can suffer from any form of joint ownership. As a developing country, Kazakhstan needs capital. On the other hand, Kazakhstan cannot distance itself any longer from Moscow due to the size of its Russian-speaking population. For this reason, Kazakhstan exhibits a conciliatory attitude in all negotiations on the legal status of the Caspian (Kutluk, D., 2003).

2.6.4 Russia

In the approach of Russia, which wants to use the Caspian Sea jointly with the coastal states, political concerns came to the fore at first. Another concern of Russia, which still sees the region as its backyard, is the growing rapprochement of Azerbaijan, which has rich oil resources, with the West, as Iran is also against. Developments over time have revealed new ideas on the Russian side. Seeing that Kazakhstan and Azerbaijan determined their own sectors and directed large international oil companies to invest in these areas, Russia took initiatives not to be left out of this formation. As a result of the three-day negotiations in Almaty on May 15, 2003, Azerbaijan, Russia and Kazakhstan agreed on the sharing of natural resources in the Caspian Sea. At first glance, although it is thought that Russia implements a policy of instability in the region and creates a balance of interests, it is seen that it is in favor of solving the problem as soon as possible with the agreements it has made with Kazakhstan and Azerbaijan. Russia now accepts the economic and political developments in the

Caspian basin and tries to protect its own interests by cooperating with the regional states, not by political opposition (Oğan, S., 2001).

2.6.5 Turkmenistan

In general, Turkmenistan stood closer to the policies carried out by the Azerbaijan-Kazakhstan-Russia trio. The point where it differs from these policies, especially with Azerbaijan, is that it cannot determine the areas where the middle line will pass. In addition, the ongoing controversial tension on this issue has brought Turkmenistan closer to Iran. As a result of this rapprochement, Turkmenistan stated that, like Iran, the Caspian problem can only be solved with the participation and consensus of five riparian countries, and that they oppose the solution of the problem through bilateral agreements.

Turkmenistan accuses Azerbaijan of acting unlawfully in the Caspian and threatens to apply to international courts. However, the current regional geopolitical balances are in favor of Azerbaijan. Turkmenistan, which failed to act like Azerbaijan and delayed in opening its national sector to foreign investors, aims to close this gap and become an important exporter of the region, especially in NG. More than half of Turkmenistan's gas located in Dauletabad and Shatlyk fields. The South Yolotan-Osman was discovered in the southeastern region of Turkmenistan in the middle of the 2000s. The field was one of the biggest in the world. Another huge field, South Gutlyayak, was discovered in August 2008. (Bahgat, G.G., 2009).

2.7 NG and Oil Production in the Rest of the World

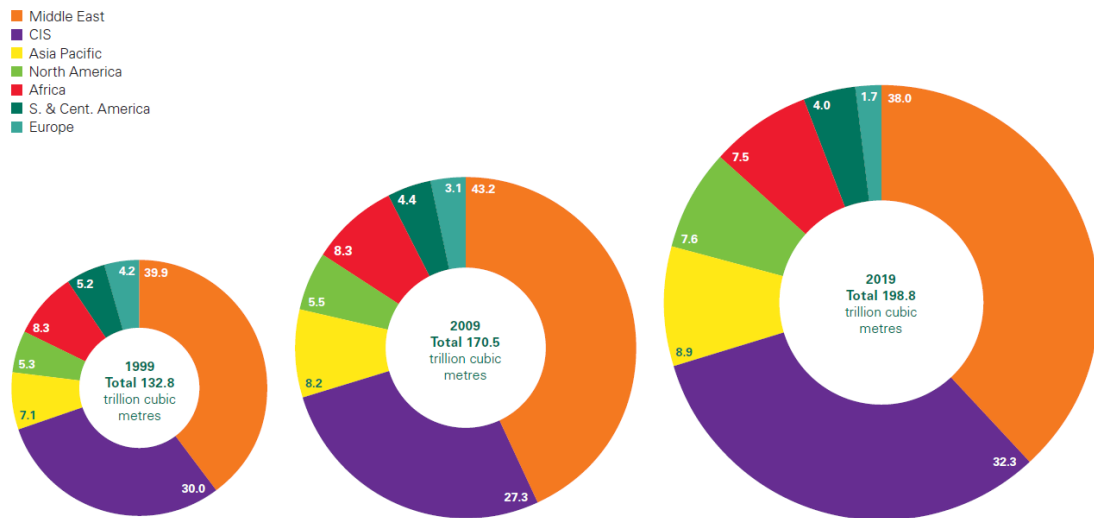


Figure 2. 8: Oil Proved Reserves Between 1999 and 2019.
Source: BP, Statistical Review of World Energy, 2019

As can be seen from the data, most of the total reserves are located in the Middle East, where OPEC countries are predominant.

This shows the importance of the region in terms of energy resources. It is seen that the political, military and geopolitical policies of the region will be challenged by the developed countries at least in the next half century and the dependence on energy will continue to be supplied from this region. In the light of the data obtained, it can be said that the oil reserves, which are non-renewable energy, have decreased continuously in the last twenty years. According to BP's energy consumption projection, although fossil fuels, especially oil, will continue to be used as a primary energy source in 2040, it is predicted that the amount of oil reserves will tend to decrease continuously. It is clear that there will be a tension or competition between countries or between countries that have oil and those that need more energy due to the increase in the unit value of petroleum in parallel with reduction in reserves. Therefore, it can be expected that

countries like Azerbaijan, which are preparing to present their reserves to the world markets, will be the focus of attention of other countries.

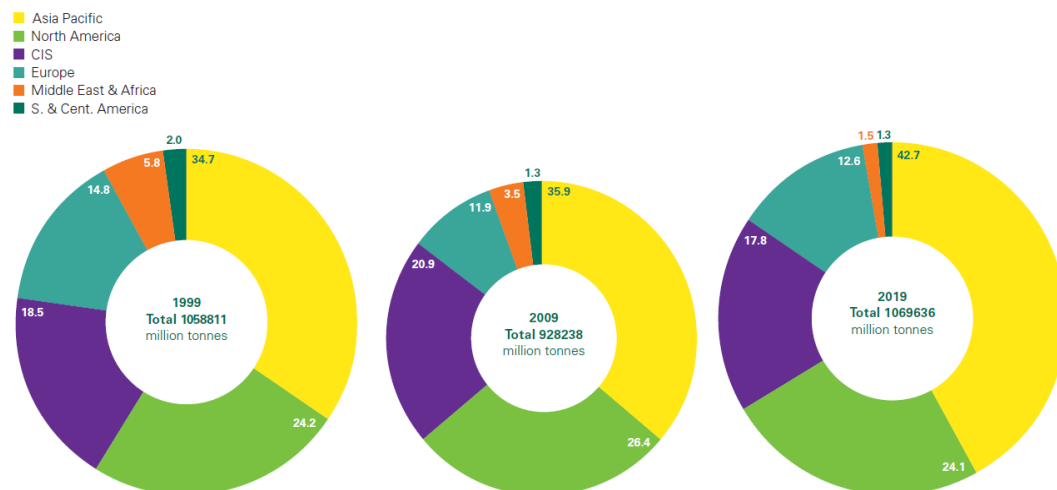


Figure 2. 9: Distribution of Proved NG Reserves between 1999 and 2019.
Source: BP, Statistical Review of World Energy, 2019

As can be seen from the data, most of the total reserves are located in Asia Pacific, North America and then CIS countries. This shows the importance of the region in terms of NG resources. European countries have few NG resources and also Asian and American NG resources transportation cost are higher and more difficult because of the distances. This problem makes the CIS countries better option for Europe.

Chapter 3

INTERNATIONAL TRADE AND COMPETITIVENESS OF NG AND OIL COMPANIES

3.1 Competitiveness of NG and Oil Industries

NG and oil industry are one of the main industries with a rich and fascinating history. When globalization of the market began to rise, a lot of competitors came up across Asia, Europe and Russia, such as Royal Dutch, Anglo Persian (British Petroleum, BP) and Shell, (Library of Congress, 2010).

Krugman (1993) emphasized that it is the firms who compete with each other, in international markets, not the nations themselves. In modern international competition, a company can compete not only in their home nation, with global strategies, but also, they can compete in many other countries (Porter, 1990).

Considering competitive advantages of nations, Porter (1990) has developed a model, called “National Diamond Model” and argues that there are five forces which any industry's rivalry is based on the threat of new entrants, threat of substitutes, bargaining power of suppliers, bargaining power of buyers and degree of rivalry. However, the company's success in an industry depends on the structure of the industry and the relation of that industry (Porter, 1980). Structure of the sector drives profitability and competition itself. To understand the current profitability of the industry and predict

future trends, a firm must find the primary causes of five competitive forces. (Porter, 2008).

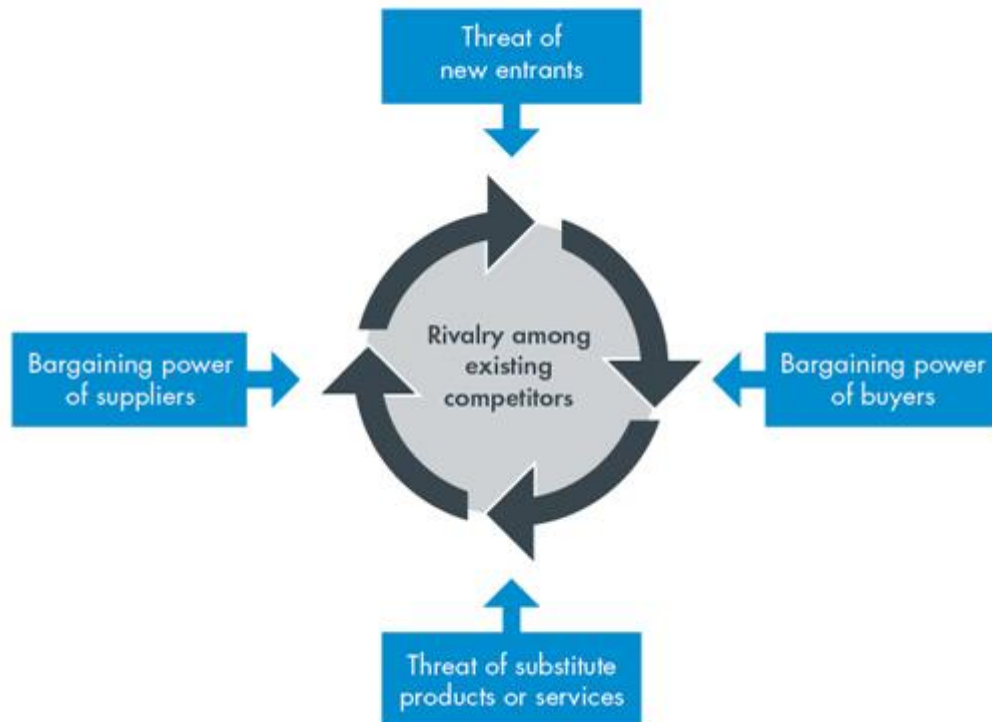


Figure 3. 1: The Five Competitive Forces That Shape Strategy
Source: Porter (2008)

3.1.1 The Threat of Entry

Porter (2008) pointed out that new entrants bring new capacity and the ambition to earn market share. Investment ratio and price sensitivity increase by this ambition, which is important for competition. According to Porter, threat of entry is determined on the height of entry barriers such as economics scale and brand loyalty.

In terms of barriers to entry, the NG and oil industries has many characteristics. For instance, these industries are costly and necessitates technical knowledge. Based on Porters National Diamond Model, a nation can only be competitive only if they have technology and know-how. He argues that, having technology and knowing how to

use this technology are the preconditions of competitive advantage of a nation. Schumpeterian approach of growth strongly supports the existence of innovation and innovative technological growth strategies.

High exit costs are another barrier to entry in the NG and oil industries. According to Campbell and Smith (2013), setting up a semi-submersible platform costs roughly \$10 million in the United Kingdom. These high exit costs can boost a company's willingness to fight and, as a result, keep future competitors out of the market.

3.1.2 Threat of Substitutes

Figure 3.2 shows that the consumption of NG and oil alternative energy resources, like wind, geothermal and solar, is increasing, and the table also shows the expected consumption in the next 20 years (EIA International Energy Outlook, 2018).

However, there are a number of obstacles that prevent them from expanding to the point of great substitution; one possible reason is that sustainable energy production is dependent on weather conditions. For instance, wind is a limited source for most of the countries, so these conditions turn the sustainable energy resources more like geographical alternatives.

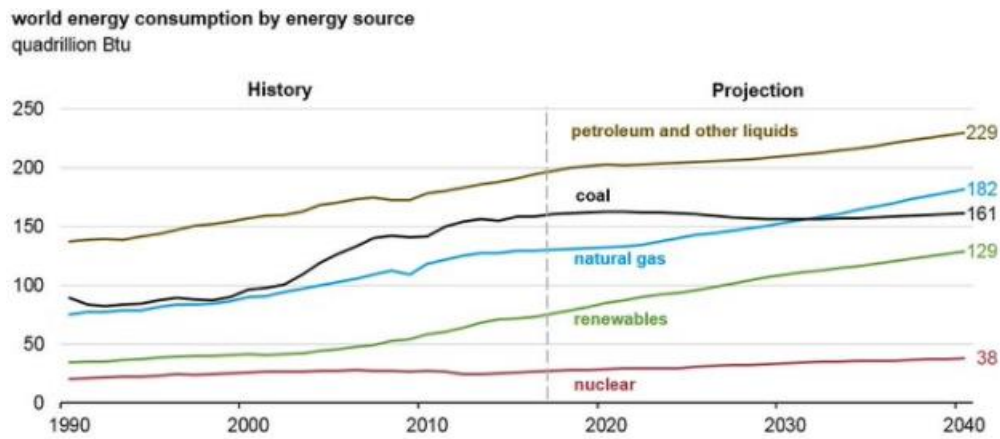


Figure 3. 2: World Energy Consumption
Source: IEA, 2018

3.1.3 Bargaining Power of Buyers

Bargaining power of buyers allows them to lower prices, request higher quality or more service (increasing the cost of service), and industry companies compete with each other at the expense of industry profitability (Porter, 2008). The majority of field operations for major NG and oil companies are outsourced to oil and NG service firms. As buyers, oil and NG companies are in a powerful position to negotiate lower prices, higher quality, or additional services.

Table 3. 1: Top 10 NG and Oil Companies in the World

Company	2018 Revenue in \$billion	Nationality
Sinopec	377	China
Saudi Aramco	355.9	Saudi Arabia
China National Petroleum	324	China
Royal Dutch Shell	324	UK-Netherlands
BP	303.7	UK
ExxonMobil	241	U.S
Total	156	France
Valero	117	U.S
GazProm	112	Russia
Phillips 66	111	U.S

Sources: EIA, Forbes, OPEC, Financial Times, Harvard Business Review, Energy Business Review.

The producers of NG and oil are major firms (table 3.1). This, at the very least, may limit buyers' power to trade and lower prices. Although all products are homogeneous with minor differences in quality, dealers' ability to charge higher prices may still be limited. Nonetheless, some largest sellers of oil have created an organization called Organization of the Petroleum Exporting Countries (OPEC). This organization decreased the capability of buyers to bargain lower prices, and this organization enable OPEC members to limit the possibility of price collapse, through the specification of production quota.

Dichristopher (2016), on the other hand, stated that OPEC companies cannot make an agreement among themselves for market share and they fight for market share, because

some members try to maximize their own interests. This means that, either sellers or buyers have not sufficient deal of power to force each other.

3.1.4 Bargaining Power of Suppliers

Some NG and oil suppliers are well-established businesses with the potential to bargain. Naumov and Toews (2015) discovered that oil prices have a strong relationship with upstream capital spending. (See figure-3.3)

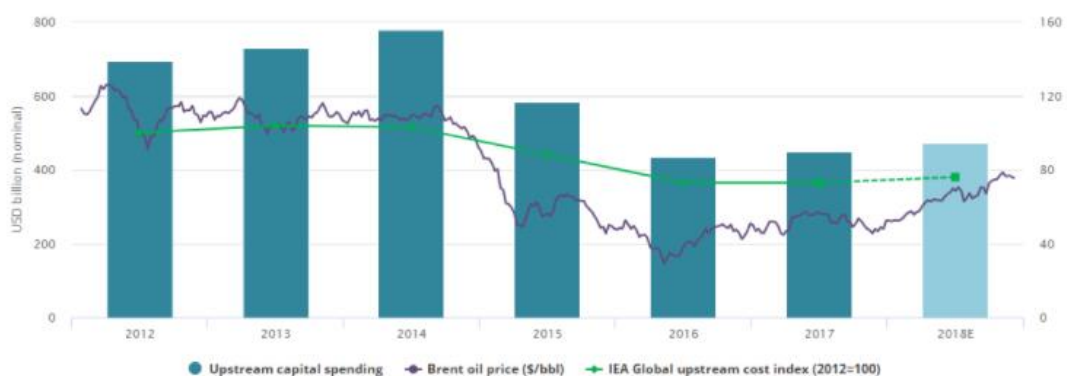


Figure 3. 3: Global NG and Oil Upstream Capital Spending (2012-2018).
Source: IEA, World Energy Investment, 2018

During the period (2012-2018), the growth in Brent oil prices and the increase in capital spending have a positive correlation. In this case, we might say that NG and oil service companies are adaptable since they adjust their costing strategies to reflect variations in oil prices. When the economy is doing well, this allows suppliers to negotiate higher prices.

On the other hand, despite E&P's (Exploration and Production) higher trust on its suppliers to carry out key operational activities in the NG and oil value chain, due to low oil prices service companies are pushed to reduce their prices (Marcel, *et al.* 2016). Furthermore, (Marcel, *et al.* 2016) suggested that service companies with falling margins are obliged to adopt more integrative collaborative, and partnership operating

models with their customers, splitting both profits and risks with E&Ps. That implies NG and oil companies are handing over a portion of their profits to the industry's top suppliers. We can say that the power of suppliers is not good enough to affect companies' performance in a significant way.

3.1.5 Intensity of Competition

If production of NG and oil slows in the future, it will increase the congestion of competition in the industry because NG and oil companies experienced this in the past combined with decreasing net liquids reserves and production (Porter, 2008). According to Hokron (2014), NG and oil firms have numerous reasons to collaborate and work together, such as through a joint venture; that cooperation stems from the demand to share risks, technological capabilities and access to capital to gain greater market power.

Porter (2008) indicates that high competition between substantial rivals can restrict the profitability of industry on the rivalry basis and consistency. Major NG and oil firms are relatively identical in dimensions, capabilities and power. This rises the intensity of competition (Porter, 2008), which can cause a price war if a competitor tries to effect prices (Menghini, 1997).

3.1.6 Competitiveness of National Economies Affected by Oil Prices on a Global Scale

One of the biggest problems of the national economy is the increasing competitiveness. There are several reasons that increase competitiveness. First, the lack of external economic barriers makes the world market a single competitive area, and only countries that can compete are included in it. Secondly, countries need to provide the high efficiency of their production elements, productive use of resources, and

continuous improvement of asset profitability in order to keep their position together with developed countries that give importance to advanced technology production and more countries to enter global competition every year. In this way, competitiveness level of the economy increases frequently as a whole.

NG and oil sources are one of the major factors for country's economic development, the export of NG and oil resources exceeds the export of other goods in many countries.

3.2 International Trade and Localization Theory

The energy industry requires private sector-led development and investment to achieve development with high rate of return, low CAPEX (capital expenditure), nominal cost and high economic rationale. When energy companies and regional states work together, energy development initiatives with economic and political logic can be a huge achievement. According to Mehmet and Yorucu (2020), private energy companies have an important role in international energy trade and have to make rational investment decisions. The goal is to assess how actors' function in practice to attain their objectives in challenging settings marked by regional geopolitical impediments and risks. The delicate interplay between geopolitics and private sector rationality is important when it comes to energy infrastructure spending. In regional settings, energy supplies are crucial for foreign policies and the formation of relations based on patterns of friendship and antagonism among regional governments. Regional states are more open to collaboration or competition with other regional powers, according to Buzan and Waever (2003) and Walt (1987). As a result, the regional actor's strength, threat motivations, and profit are the key drivers of regional unity and positioning. The interaction between geopolitics and private sector

rationality always dictates the decision-making and context in the energy sector when it comes to resource monetization and development. Geopolitics has influenced policy and the selection of partners for energy project collaboration, supplying the necessary purchase contracts, investment flows and long-term production for energy projects (IGU, 2012).

3.2.1 Oil Trade Movement in the World

Oil exploration activities require high investment. In the relationship between the investment cost and the profit obtained in oil exploration activities, when the cost rate increases and the profit rate decreases, the investment rates of the companies decrease. The most important point affecting this rate is in case of a decrease in oil prices. In this case, the investing companies pay attention to the demand rates. Companies can invest in two ways. The first option is to invest in countries with a market share in order to process the oil produced, and the other option is to invest in the oil producing countries and process the oil in the place where it is produced. The second option may lead to an increase in the transfer costs of petroleum products obtained as a result of oil processing. Among the factors affecting the transfer options, geographical location, the human resources of the producing country and the distance to the market are important. For this reason, the IEA, which was established to control the energy trends produced and consumed, supports the process by creating analyses in the direction of energy prices, transfer of energy, and formation of energy policies.

World Energy Statistics for 2019 published by BP in 2018, when the oil trade movements between 2010 and 2018 is examined in the evaluation report, it is observed that there is an increase in trade as in the production and consumption reports. While there was 54320 thousand barrels of oil imported per day worldwide in 2010, 71344

thousand barrels of oil per day was imported in 2018 with an increase of 1.9%. 21.2% of the total imported oil was imported to European countries, 15.5% to the Republic of China, 13.9% to the USA and 36% to other countries. According to the same report, the world's largest oil exports were realized in the Middle East, where production was the highest. While Saudi Arabia's oil exports in the Middle East constitute 12% of the world's overall, other Middle Eastern countries exported 22.5%. While Russia exported 12.8%, the Commonwealth of Independent States countries exported 3%. (Table-3.2 below)

Table 3. 2: Oil Trade Movements in the World (2010-2018)

Country	2010 (thousand barrels daily)	2018 (thousand barrels daily)	Share 2018
Importers			
US	11689	9929	13.9%
Europe	12407	15124	21.2%
China	5886	11039	15.5%
India	3749	5223	7.3%
Rest of the World	17048	26087	36.0%
Total World	55346	71344	
Exporters			
Russia	7257	9159	12.8%
Other CIS	1861	2170	3.0%
Saudi Arabia	7276	8553	12.0%
Middle East (ex. Saudi Arabia)	11744	16087	22.5%
Rest of the World	1340	594	0.8%
Total World	55346	71344	

Source: BP, Statistical Review of World Energy, 2019

Note: Since the table does not include all countries values, total world values don't consist of table values.

In 2018, European countries imported a total of 519.2 million tons of crude oil. They imported 153.3 million tons of this amount from Russia, 117.3 million tons from Middle Eastern countries, 63.2 million tons from the Commonwealth of Independent States, and 63.1 million tons from North West African countries. The Commonwealth of Independent States, including Azerbaijan, ranks third in the oil imports of European Countries. (See Figure 3.5 below)

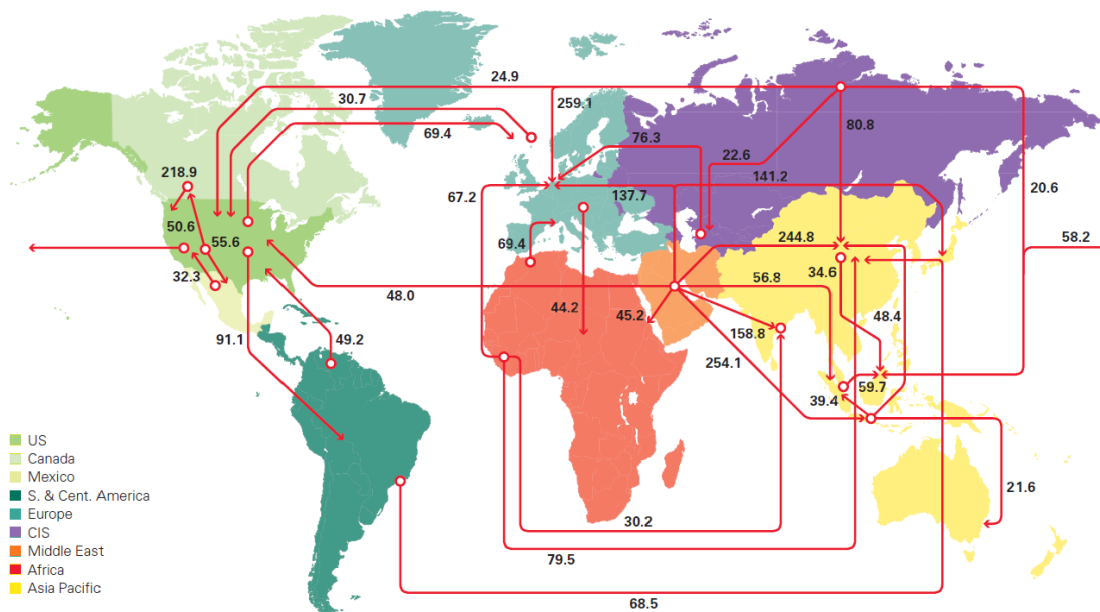


Figure 3. 4: Major Oil Trade Movements in the World (Million Tons)
Source: BP, Statistical Review of World Energy, 2019

In the world oil trade movement, not only crude oil trade develops, but also petroleum products are imported or exported. While European countries import 112.5 million tons of processed products from Russia and 8 million tons from Middle Eastern countries, they import 9.8 tons of processed products from the CIS (Commonwealth of Independent States). When the number of imported products is examined, the routes of import and export are important.

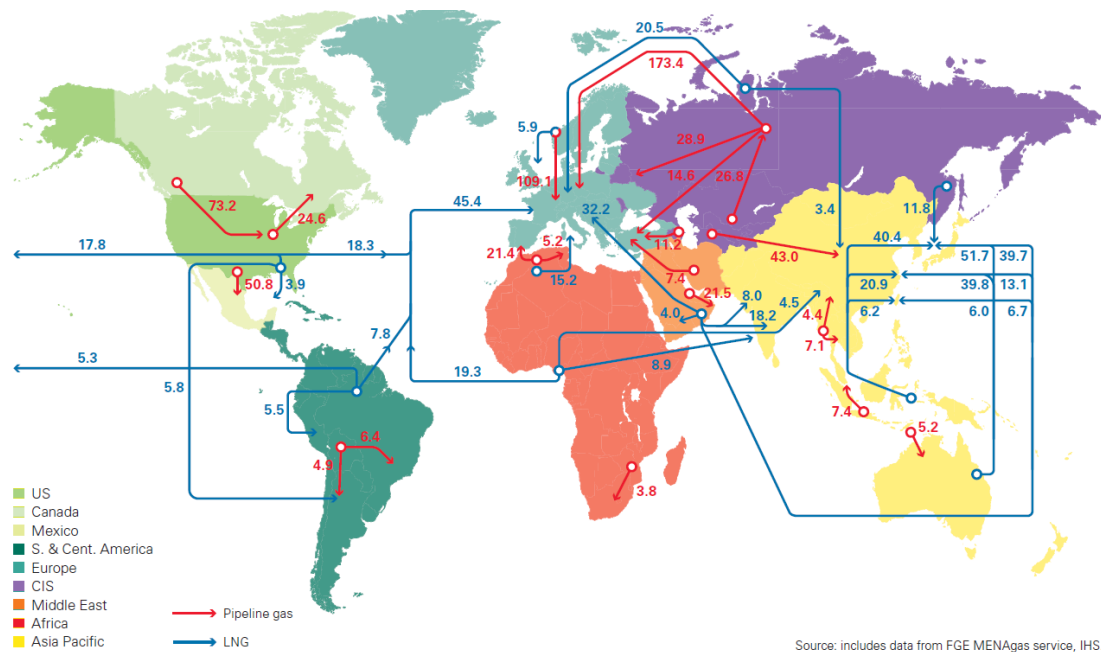


Figure 3. 5: Major NG Trade Movements in the World (Million Tons)
Source: BP, Statistical Review of World Energy, 2019

3.2.2 Localization Theory

In the localization theoretical framework, locators are considered as the final elements that determine the behaviour of actors participating in the energy sector. Geopolitical variables and global energy market dynamics are supported by these location factors in the energy sector. The importance of local factors is strengthened or decreased by geopolitical and global market related dynamics and issues. The combination of local factors and market rationality allows energy providers to archive cost-effective economic monetization and infrastructure projects while also enhancing their economic rationale for investors. And we called this ‘rational behavior’ (Yorucu and Mehmet, 2018). Location Theory and market rationality indicate that regional energy producers focus on markets that are close by and can commercialize and transport resources at a low cost, rather than customers that are far away. From von Thunen (1826) through Krugman (1991, 1993), researchers have been studied the importance of location in affecting economic activity and trade patterns. In relation to the core and

periphery concept, it asserts that economic activity carried out in a central place has the advantage of serving first and foremost the hinterland that surrounds it. Given the relevance of the Caspian basin's geographical proximity and geopolitical dynamics, we used Paul Krugman's (1993) Location Theory to investigate NG trade in global energy markets in this master thesis. The nature of the externality, according to Krugman's "core-periphery model," market size effects induce producers to seek to concentrate near big markets and position large marketplaces where producers are concentrated in the face of transportation costs from forward and backward connections. The Caspian basin, according to Krugman's argument, is part of Europe's core, while energy-needed Eastern and Southern Europe is part of the periphery.

"Nations are important in international trade - they exist in a modelling signification because nations have governments whose activities influence the motion of factor and goods." as stated by Krugman (1993). In addition to that, Krugman (1993) also pointed out that National borders, in particular, are frequently used to block trade and mobility of factors. In light of the billions of dollars invested in extraction and exploration operations, the development of NG and the construction of pipelines across borders are sensitive to core and periphery model of Krugman. The relevance of geographical proximity and regional relations in Regional Security Complex and Localization Theories, explain why states construct pipelines, and how proximity and economies of scale impact energy development and export projects decision-making. It's feasible to consubstantiate regions within a multi-regional framework using the core-periphery paradigm. Because he didn't want to worry about an endpoint, Krugman envisioned a separate set of areas scattered across a one-dimensional environment that had to be circular. Six zones are arranged in a circle, with one way to travel only around the

circle. Again, there isn't any room for mobility in the middle. We'll look at two NG sources: NG of Russia, which is distributed evenly across the nations, and NG of Azerbaijan, which is distributed on choice. A possibility is that the economy converges into a single core, as indicated by the colouring of one region in Figure 3.5. NG flow may be equally distributed throughout regions if transportation costs are high, economies of scale are inadequate, and the share of footloose output is minimal. It's also feasible to have an economy with numerous centers. Shaded circles in Regions 1 and 4 represent the creation of two cores, as shown in Figure 3.6. Each core is thought to have a "hinterland" made up of the two neighboring regions. We make these assumptions to figure out which picture is correct. More than one equilibrium structure is possible, as technology and prices make two alternatives possible.

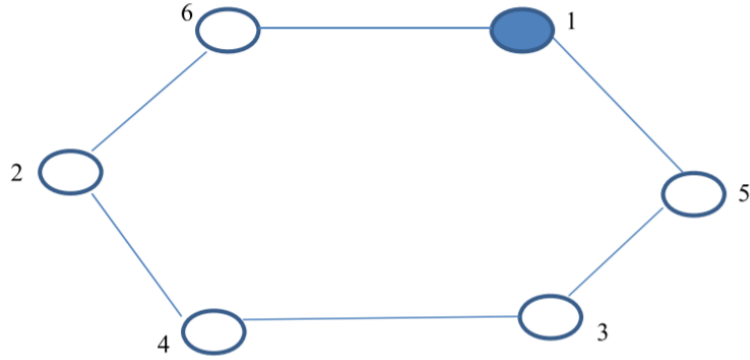


Figure 3. 6: Single Core Structure in a Multi-Regional Framework
Source: Krugman (1991)

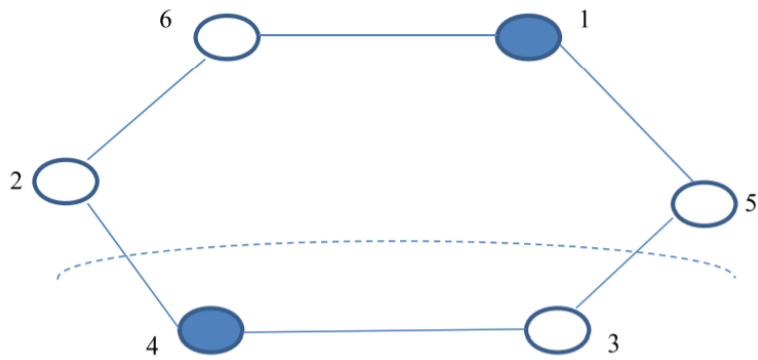


Figure 3. 7: Multiple Core Structure in a Multi-Regional Framework
Source: Krugman (1991)

Another hypothetical scenario is as follows: Figures 3.5 and 3.6 illustrate a world divided into two countries, one with two regions and the other with four. The dotted line in Figure 3.6 represents the boundary. It's believed that the two countries retain adequate barriers and factor mobility for trade at first, allowing their economic geographies to evolve separately, with the major country will create a core in region 1, while the minor country will build a smaller core in area 2. In this way, the two countries are combined into a single economic unit. Bringing Russian and Azerbaijani gas resources together in one pipeline. The SGC (Southern Energy Corridor) pipeline transports the generated NG to a Southeast European hinterland (Özdemir et al., 2015).

Considering Russia as the largest holders of gas reserves. Azerbaijan, Iran and others are regional hinterlands which involved in trade with Europe. In order to elaborate regional and rational divergences, an index can be constructed:

Let v_i be the share of gas industry i in total NG reserves and annual gas production capacities to be delivered in same region/country, “asterisk” (*) indicate that we are referring to some other region/nation. Then the index can be derived as

$$\sum_i |v_i - v_i^*|$$

Assume that two regions, such as Russia and Azerbaijan have identical NG structures, that is, their industry shares of market, importers were the same for all i . Then the index would be equalized to zero. However, if two regions have completely disjahted industry structures, the index would be z (assuming each share m each region would be count in all.) This index, as also defined by Krugman (1993) is a rough way of quantifying differences in structure, and hence regional specialization, that is amended and implemented in our study, to put emphasis on two significant gas game/player in Caucasus gas market both heading European destination as two rivals. Similarly, Rodrik (1982) also measured the structural changes in comparative advantage by using indication method.

3.3 NG Demand Modelling

The most commonly specified mathematical form for internationally traded gas demand function is log linear. Yorucu (2018) has expressed the multiplicative relationship as follows:

$$Y = aX_1^{b_1}X_2^{b_2} \dots X_k^{b_k} \varepsilon^u \quad (1)$$

Where;

Y is the demand for internationally traded gas

$X_1 \dots X_k$, the explanatory variable

ε , an error term

a_1 , the constant intercept

$b_1 b_2 \dots b_k$, elasticity coefficient parameters

$\varepsilon \approx 2.178$, the base of natural logarithm;

The log linear transformation of equation (1) can simply be constructed as;

$$\ln Y = \ln a + b_1 \ln X_1 + b_2 \ln X_2 + \dots + b_k \ln X_k + \varepsilon_t \quad (2)$$

The multiplicative model corresponds to the assumption of constant elasticity. The derivative of Y with respect to X_1 in equation (1) simply yields;

$$\begin{aligned} \delta Y / \delta X_1 &= a b_1 X_1^{b_1-1} X_2^{b_2} \dots X_k^{b_k} \varepsilon^u \\ &= b_1 (a X_1^{b_1-1} X_2^{b_2} \dots X_k^{b_k} \varepsilon^u) / X_1 \\ &= b_1 Y / X_1 \end{aligned} \quad (3)$$

The elasticity of gas demand (Y) with respect to variable X_1 is defined as:

$$q_{YX} = \delta Y / \delta X_1 \cdot X_1 / Y \quad (4)$$

Substitution of equation (3) into equation (4) gives;

$$q_{YX_1} = b_1 \quad (5)$$

And b_1 is the constant elasticity of Y with respect to X_1 and in general b_j is the constant elasticity of Y with respect to X_{j1}

$$j = 1, 2, \dots, k$$

Constructing the traditional NG demand function:

$$Y = a X_1^{b_1} X_2^{b_2} X_3^{b_3} X_4^{b_4} X_5^{b_5} \varepsilon^u \quad (6)$$

Y is the demand for NG from origin of Azerbaijan to a given destination j (EU).

X_1 , destination country's consumers' disposable income.

X_2 , then oil indexed/spot market internationally traded gas prices.

X_3 , the price of gas in other substitute markets (i.e. Russia, Iran, Turkmenistan, Kazakhstan, etc.)

X_4 , the exchange rates (Dollar price of gas against Euro) (Euro is the destination country's currency).

X_5 , the taxation (including VAT and excise tax).

a , is an intercept.

b_1, b_2, b_3, b_4, b_5 , the estimated elasticity coefficient (slopes)

ε^u , the random disturbance error term.

This demand model can be used to estimate elasticity parameters of the given variables which include overall gas prices and import capacity of European destinations.

This study extends its discussion on theoretical basis and leaves the ground of empirical estimations for the practitioners or academic researchers in further research studies, such as PhD or MSc. The model can be used for time series regression analysis on a single country basis as well as cross-sectional or panel studies through implementing linear or non-linear estimations. Techniques, such as ARDL, non-linear ARDL.

Considering Krugman's theory of Localization or location theory for the economic geography perspective, production cost of gas, labour cost, transportation cost (via pipeline transportation), exchange rates, taxation and economies of scale are the most potent determinant of competitiveness, why cannot we consider the classical

prosperity pool of labour as the most determinant of diversion tool in the determination of national prosperity, as argued by Porter (2008).

Krugman (1993) on the contrary argued to wish light the differences in regional growth, which is more rational when NG trade is important for Europe, especially after TANAP is completed and Turkstream is the biggest rival on the substitute. Considering international specialization; best is to understand the importance of local specialization. The geographical issues which economic geographers should worry about are the location where gas production is taking place, especially where service is concerned.

Chapter 4

NG AND OIL PIPELINES FROM AZERBAIJAN

4.1 Baku-Tbilisi Ceyhan Pipeline

The BTC (Baku-Tbilisi Ceyhan) pipeline transports oil and condensate from the ACG (Azeri-Chirag-Deepwater Gunashli) field across Azerbaijan, Georgia, and Turkey. The BTC has an economic advantage and provides the principle of supply security demanded by the international standards, on the other hand, the implementation of a project that was previously thought impossible, is also valuable in that it initiates new regional projects. On June 2006, the first oil tanker was loaded at the export terminal and officially started the process of transporting Azeri oil to international markets. The total length of the pipeline is 1,768 km. Its length within the Azerbaijani border is 443 km, 249 km in the Georgian border and 1,076 km in the Turkish border.

BTC has facilitated access to the high seas, for the oil-producing countries of Central Asia, this line has created an alternative route to the oil pipelines going to the Black Sea by passing through Russian territory. The importance of BTC is increasing every year for both the oil producing states of the region and the oil consumer countries of Europe.



Figure 4. 1: Map of BTC Pipeline

BTC Co. is the owner and operator of this pipeline, this consortium includes 11 energy companies, and BP (British Petroleum) manages the consortium, present shares of the international energy companies; BP (British Petroleum) 30.1%, SOCAR (Azerbaijan) 25%, Chevron (USA) 8.9%, Statoil (Norway) 8.71%, TPAO (Turkey) 6.53%, Eni (Italy), 5%, Total (France) 5%, Itochu (Japan) 3.4%, Inpex (Japan) 2.5%, ExxonMobil (USA) 2.5%, ONGC Videsh (India) 2.3% (BP, 2019). After the construction was completed, 254 million barrels of oil were transferred in 2017 and 9 billion barrels of oil was transferred in 2019. The project continues to transfer an average of 700-750 thousand barrels of oil per day. While the oil obtained from the Shah Deniz project is mainly transported over BTC, the transportation of Georgia and Turkmenistan oil is also carried out.

4.2 South Caucasus Pipeline

This project has been named the South Caucasus Pipeline (SCP) due to its access to the Georgia-Turkey border. The aim of the project is to deliver the natural gas produced in Sangachal to buyers in Azerbaijan, Georgia and Turkey within the scope of the Shah Deniz project. A pipeline with a total length of 692 km has been laid to reach these countries. As in the Shah Deniz project, BP and SOCAR are the operators of the partnership company. The partners of the SCP project and their shares; BP (United Kingdom) 28.8%, TPAO (Turkey) 19%, SOCAR (Azerbaijan) 10%, Petronas (Malaysia) 15.5%, Lukoil (Russia) 10%, NICO (Italy) 10% (BP, 2019). The pipeline, which was originally created with the aim of pumping 9 bcm (billion cubic meters) of gas annually, was increased to 10 bcm with expansion works.



Figure 4. 2: The Map of SCP, TANAP and TAP

4.3 Trans Anatolian Pipeline

The purpose of the Trans-Anatolian Natural Gas Pipeline Project (TANAP) is to transport the natural gas produced in Azerbaijan's Shah Deniz 2 Gas Field in the Caspian Sea and other fields in the south of the Caspian Sea primarily to Turkey and then to Europe. TANAP combines with the South Caucasus Pipeline (SCP) and the Trans-Adriatic Pipeline (TAP) to form the Southern Natural Gas Corridor. Total length of this pipeline is 1850 km, TANAP starts from the Turkish-Georgian border and pass through 20 provinces and end in the Ipsala district of Edirne on the Greek border. From this point, it will be connected to the TAP NG Pipeline, which will transfer NG to European countries. There will be two exit points for connection to the national natural gas transmission network, one in Eskişehir and the other in Trakya. The capacity of TANAP is 16 bcm but it will be extended to 31 bcm. NG will be delivered from Azerbaijan to the Turkish-Georgian border via SCP (South Caucasus Pipeline), then it will be connected from Turkey to the Greek border via TANAP, then the pipeline will be connected to Italy from Greece, Albania by TAP.

4.4 European Energy Security Meets with Azeri NG and Oil

The EU is a major importer of energy resources. It has only 0.6% of the world's energy reserves and production. In addition, the share of exports of petroleum-derived products is around 60%. For this reason, it shows the feature of being a foreign-dependent continent in terms of energy. It obtains most of its energy from Russia via the Black Sea, and imports a small part from the Middle East and Northwest Africa via the Mediterranean.

With the 2006 Memorandum, within the framework of the Energy Strategic Partnership between Azerbaijan and the EU, in addition to technical cooperation and

personnel training, Azerbaijan's energy security has ensured the safety and security of energy transfer between the 2 regions by creating renewable energy policies. This reliance on imports raises worries about energy supply security, particularly in regions where social-economic or geopolitical conflict is a possibility. The Ukraine-Russia NG dispute in 2009 and Russia's annexation of Crimea in 2014 are two recent occurrences that have posed a danger to EU energy supplies. In terms of energy security of the European Union, natural gas restrictions applied by Russia within the framework of the crisis between Russia and Ukraine have come to the fore. Russia is the country with the largest NG reserves in the world, and also European countries supply the most NG from Russia. Europe imports 66% of its NG and 90% of its oil. Europe is a continent with limited resources and energy dependency. Such occurrences underscore the need for a more comprehensive energy policy to address potential energy supply interruptions and security concerns, notably through the diversification of supply choices.

Such motives fueled the 2014 adoption of the "European Energy Security Strategy," which included diversification of NG suppliers as one of the top targets. The Energy Union Package reflected the same concept, particularly for Central and Eastern European countries, which are particularly unguarded due to a lack of suppliers.

The SGC, a significant infrastructure project to carry NG from the Caspian Sea into the EU, is seen as a substantial part of the diversification policy by the European Commission. The EU is also actively involved in financing the TAP (Trans-Adriatic Natural Gas Pipeline), a component of the SGC currently being built to transport Azeri NG to European markets, with the European Investment Bank approving € 1.5 billion loan to TAP, demonstrating its strong commitment to the SGC. Republic of Azerbaijan

is now the only Caspian Sea country with existing infrastructure that can deliver NG to Europe via the SGC. Furthermore, the completion of ongoing and planned projects such as Shah Deniz 2 and Shah Deniz 3 will significantly boost Azerbaijan's NG export capability (Rzayeva, 2013).

Several major oil companies, including BP (British Petroleum), Total Fina Elf, and Statoil, have inked joint ventures with Azerbaijan, corresponding with the rising existence of some EU member states. The pipeline expansions have enhanced Azerbaijan's economic cooperation with Western democracies and reinforced its perception as a reliable energy partner.

Chapter 5

CONCLUSION

The study aims to make an analysis about gas and oil sector's effect on Azerbaijan's economy. One of the measurements of this effect is rich energy resources in Azerbaijan's territory, and the other one is the importance of geographical location. I believe that this thesis will help to those who are interested in NG-oil trade movements, energy security issues, and power of major energy companies. In this thesis we present gas demand modelling as a theoretical framework to show the significance of transportation costs. Geography enters the model through transportation costs, which requires the distribution of firms trying to take advantage of increased returns in a monopolistic competitive market.

The results based on our research, NG and oil exports of Azerbaijan has been expanding. Russia's behavior to EU, high energy prices, monopolistic energy markets and the need for alternative energy hubs have a huge impact for Azerbaijan's role in the game. The BTC and SCP has been changing the monopolistic view of Caspian Sea as a small country's pipelines but with TANAP, Azerbaijan might be a game changer in the near future.

TANAP has a huge importance with its geopolitical location. In the next few years, the partnerships of TANAP might increase with different major companies and with neighbor countries. Turkey's role of this pipeline has been increasing and with

different partnership it's possible to be the price changing country. May be, in the near future Israel and Cyprus's NG can be the new route of TANAP and BTC. Turkey and Azerbaijan's power on energy resources will be increased against Russia's power on energy pricing.

The location of TANAP has a potential for Leviathan gas, as long as political matters with Israel and Turkey are normalized. They should first resolve the geopolitical problems to be able to connect the Leviathan gas with TANAP. Additionally, Cyprus's NG has to find possible partners and then there are challenges to construct new pipeline to Turkey. Nations' problems affect the pricing of energy resources as well as partnerships for new energy routes. If these problems can be fixed in the coming years, Azerbaijan and Turkey's role in energy trade might be a challenge and perhaps Turkey will be a new NG hub in the Eastern Mediterranean.

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