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Terms of Trade in Oil Exporting Countries. The case of Kazakhstan.

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Contents

List of Figures

List of Tables

Introduction

Oil is a commodity with particular characteristics. It covers unique roles from being the natural heritage of a country to the motor of global industrialization, it impacts on different economies with its price volatility and consequent boom–bust cycles, it requires especially high capital intensity and technological sophistication, and provides the exceptional generation of profits that accrue to the state and to private actors.

Developing countries often consider a development reliant on their mineral resources as a key path to seek sustained economic growth. This path of development lead the countries in the position to be overwhelmingly dependent on the revenues gained from the exports of their mineral commodities, like in the case of oil dependent countries. This strong dependence is reflected in export profiles, with oil that is generally responsible for more than a half of the exports, such an high ratio can affect economic growth.

In literature, two main arguments have been advanced to explain the effect that the specialization in the export of primary products and/or commodities is not always advantageous to growth. One is the Prebisch–Singer thesis, which asserts that the price of primary products declines relatively to the price of manufactured goods over the long term. The other is related to the instability of export revenues, due to the volatility of commodities prices. Oil prices experiences rises and falls in times do to swings in production and demand conditions. Economies, companies and global geopolitics are affected by the sharp fluctuation of prices, both up and down. For countries, a high oil price can affect government budgets and prompt wholesale economic forum.

In this thesis, the purpose is to analyse the economy of an emerging country that built its growth mostly on the export of oil. The focus is the examination of the terms of trade trend, whose theory is described in the first chapter. The second chapter briefly introduces the current energy market, with the aim to highlight its main players and trends. Then, the third chapter proceeds with the analysis of the case study: the economy of Kazakhstan, a relatively young developing country, where the mineral commodities export weighs considerably on the exports structure. The analysis is focused on describing how an oil price shock impacts on the Kazakh terms of trade. The results will help us in achieving a better understanding about the reasons that push reforms programmes promoted by the Kazakh government, in order to build a more preferable future development for its citizens.

CHAPTER 1 - TERMS OF TRADE

1.1 A Theoretical Framework

The Terms of trade is the most important determinant of the distribution of gains from trade, it is an important measure to evaluate gains to individual countries from international trade.

The basis of the international trade, according to the Ricardian theory, was the comparative cost differences in the production of different goods. In his theory, Ricardo did not investigate to explain precisely how values were determined in international trade, which means, he did not attempt to explain where exactly the international exchange ratio would lie and how it would be determined.
It was left to John Stuart Mill (1844) with his work *Of the Laws of Interchange between Nations; and the Distribution of the Gains of Commerce among the Countries of the Commercial World* to investigate and to explain the determination of the terms of trade in international trade.
In international economics, Terms-of-Trade refers to the ratio index of export prices to import prices. It is the ratio at which a country's exports are changed for imports.
The Mill's doctrine explains that the international terms of trade between two commodities will depend upon the strength of the world supply and the demand for each of the two commodities. This means, in other words, that the Terms of Trade is determined by reciprocal demand – the reciprocal demand theory. Following the content of Mill's reciprocal demand theory (1844), the author points out that the actual ratio at which goods are traded will depend upon the strength, and elasticity of each country's demand for the other country's product, or upon reciprocal demand. The domestic production costs determine the outer limits of a range where the possible Terms of trade values may fall, while the relative strength of reciprocal demand sets the actual Terms of Trade within this range.
Ellsworth and Leith (1969) sum up the Mill's reciprocal demand theory in the following way: "a) the possible range of barter terms is given by the respective domestic terms of trade as set by comparative efficiency in each country; b) within this range, the actual terms depend on each country's demand for the other country's products; and c) finally, only those barter terms will be stable at which the exports offered by each country just suffice to pay for the imports it desires". Mill (1844) has also theorized the so called Equation of International Demand, which describes the equilibrium of the terms of trade, that is when the value of each country's exports just equals the value of its imports.

Mill's (1844) theory of reciprocal demand is subject to a number of criticisms. Important critics towards Mill's approach has been moved by F. D. Graham in his work *The Theory of International Values* (1932) and Jacob Viner in his work *Studies in the Theory of International Trade* (1937). Their critics touch the following grounds: theoretical assumptions, neglect of supply, over simplification

about important factors, neglect of domestic demand, variation of the country's income, size of trading countries.
The critic moved by Graham (1932) touches several of these points. Firstly, Graham (1932) critic is focused on the theoretical assumptions, which, he says, are characteristic of the more classical economic analyses, that makes Mill's theory susceptible to similar weaknesses which are found in the Ricardian analysis.
The criticized assumptions consist on: the existence of full employment, perfect competition, free trade, free mobility of factors of production, specialization on the basis of comparative advantage, absence of transport costs. These assumptions, although they do not picture the situation of the real world economy, do not completely invalidate Mill's doctrine.
Then Graham (1932) critic points out that one of the major weakness regarding the reciprocal demand theory is that is focuses too much on the demand role, and in so doing, it fails to care properly about the role of supply in determining international values, while supply conditions can fluctuate quite notably to affect the international exchange ratios.
Beyond the critic over the supply role, Graham (1932) argues that Mill (1844) has not paid proper attention to several other factors, sinning of over simplification. Factors as price and wage rigidities, transitional inflationary and overvaluation gaps and balance payments problems could impact on the exchange ratios as well.
In addition, not only the foreign demand, but also the domestic demand can affect the terms of trade. These considerations, as well as the possibility of a variation in the country's income, does not appear to have been given the due importance by Mill.

The reciprocal demand theory best applies when both nations are of equal economic size: if both the nations are of approximately the same size and with similar taste patterns, the gains from trade will be shared about equally between them. In this case the demand of each nation has a noticeable effect on market price.
In the trade between countries of unequal size reciprocal demand seems to have little relevance.
If one nation is small and the other very large, the relative demand strength of the smaller nation is likely to be dwarfed by that of the larger nation. The production capacity of the smaller country is not sufficient to face the needs of the larger country and, at the same time, the smaller country cannot fully absorb the production from the larger one. This situation leads to incomplete specialization in the larger country and a complete specialization in the smaller country.
The smaller country will have to take whatever is offered by the larger country and export what is required by latter. Moreover, a small country is usually a price-taker rather than a price-maker.
Since the international price ratio will be very close to the domestic price ratio of the larger nation, the major beneficiary from trade would be the smaller country rather than the larger country.

Despite the criticism, Jacob Viner (1937) denotes that the “reciprocal demand analysis is an attempt, imperfect but superior to available substitutes, to describe the aggregate or average results of such changes in desires or cost when they affect appreciably a wide range of commodities. The terms of trade can be directly influenced by the reciprocal demands and by nothing else. The reciprocal demands in turn are ultimately determined by the cost conditions together with the basic utility functions”.
Viner (1937) also denotes that “in the exposition of Mill and his followers, the defect is not that they exaggerated the importance of reciprocal demand in the determination of terms of trade, which is logically impossible, but whatever they may have known, they did not sufficiently emphasize the influence of cost conditions on reciprocal demand”.
Regarding the use of the specific expression “Term-of-Trade” to address the relative concept, it is important to highlight that it did not start with Mill’s work (1844). According to the University of Michigan recent research seminar on the topic1, it seems that it was Marshall (1923, p. 161) with his work *Money, Credit and Commerce* who introduced the term, in fact while reporting an example involving countries E and G, he spoke of “the amounts to which *E* and *G* would be severally willing to trade at various “terms of trade”; or, to use a phrase which is more appropriate in some connections, at various “rates of exchange." Later, the expression appeared in the work of Taussing (1927), who spoke of the terms of trade of a country while working at the formulation of the net and gross barter terms of trade, and has been retaken by Jacob Viner (1937, pg 319), who in his work addresses to terms-of-trade concept saying that: “In the classical theory, the discussion of the role of variations in prices in the mechanism of adjustment of international balances relates not to relative variations in prices of identical commodities in different markets, but to relative variations in prices of different commodities in the same markets, and primarily to relative variations in prices as between export and import commodities. It concerns itself, therefore, with the effect of disturbances on what are now called the terms of trade.".
After Taussing (1927) formulated the concepts of the net and gross barter terms of trade, further essential contributions in the formulations of the Terms-of-trade were made by Jacob Viner (1937), who introduced the single and the double factoral terms-of-trade, and Dorrance, G. S. (1948) who introduced the income terms of trade - all these formulations will be discussed in 1.2 session.

1.2 Definition

In international economics and international trade, terms of trade are the ratio of the price of the exported good to the price of the imported good. There are a number of different concepts, definitions and associated statistical measures of the terms of trade, some of them are listed below:

i. The commodity or net barter terms of trade (*N*).

[1] See Deardoff Alan V. (2016)

This is the most common meaning of the term. Commodity terms of trade of a country are defined as the unit value (price) of exports of the country divided by its unit value (price) of imports. This index measures unit gains from the trade amount: imports (i.e., the volume of imports) that are available for one unit of exports (William, 2008). For this ratio, it is appropriate to use the term *unit value* rather than *price* because different heterogeneous commodities are aggregated into a single commodity category such as exports or imports (William, 2008). Basically it expresses the relative price of the "exportable" in the terms of the "importable", that is the number of units of imported goods that a country can achieve for each unit of exported goods (William, 2008). In a world of many traded commodities, the terms of trade of a nation (N) are given by the ratio of the price *index* of its exports (P_X) to the price *index* of its imports (P_M) (William, 2008). This ratio is usually multiplied by 100 in order to express the terms of trade in percentages.

$$N = (P_X / P_M)\ 100$$

According to Taussing (1927), the net barter terms of trade are relevant only when nothing enters into the trade between countries except sales and purchases of merchandise. Thus, the concept of net barter terms of trade has certain drawbacks. It measures only the gain or loss arising out of relative changes in the export and import prices (Cherunilam F., 2008). It completely ignores the impact of factors such as changes in the level or volume of imports and exports, changes in the quality of exports and imports, changes in the composition of trade, changes in the productivity of export industries and unilateral payments (Cherunilam F., 2008). Taussing (1927) introduced the concept of gross barter terms of trade to correct the commodity or net barter terms of trade for unilateral transactions, or exports or imports which are surrendered without compensation or received without counter payment, such as tributes and immigrant's remittances (Cherunilam F., 2008).

ii. The gross barter terms of trade (G).
This is the ratio of the volume of imports (M) to the volume of exports (X). It coincides with the commodity terms of trade when trade is balanced (Deardorff, 2016).

$$G = M/X$$

The appropriateness of incorporating unilateral payments into the terms of trade has, however, been questioned (Cherunilam F., 2008). Haberler (1935) has suggested that allowance should be made separately for unilateral transactions, instead of incorporating them in the terms of trade index (Cherunilam F., 2008). Though Taussing (1927) introduced the concept of gross terms of trade as an improvement over the net barter terms of trade, it also have certain defects (Cherunilam F., 2008). For instance, like the net barter terms of trade, it also does not reflect the impact of changes in productivity nor changes in the quality and composition of foreign trade (Cherunilam F., 2008).

iii. The income terms of trade (*I*).
The economist Dorrance (1948) introduced this concept. In his works he argued that the important point for a country's welfare was to define the amount that it could buy with the total income generated by its exports. This concept is referred to the purchasing power of exports and it corresponds to the commodity terms of trade multiplied by the volume of exports (Q_X). The Income measures the nation's export-based capacity to import (Cherunilam F., 2008). The change in the income terms of trade is very important for developing nations, since they rely to a large extent on imported capital goods for their development.

$$I = (P_X / P_M)\, Q_X$$

It should be clear that *I* indicates only the export-based capacity to import and not the total capacity of the nation to import (Cherunilam F., 2008). The total capacity to import depends on factors like capital inflows (Cherunilam F., 2008). Even when export prices decline and import prices remain constant the income terms of trade will improve if the physical volume of exports increase more than in proportion to the fall in export price (Cherunilam F., 2008). This very well demonstrates that a change in the income terms of trade need not necessarily reflect the real gain or loss (Cherunilam F., 2008). This is a serious drawback of this concept (Cherunilam F., 2008).

iv. The single factoral terms of trade (*S*).
It corresponds to the commodity terms of trade multiplied by a *productivity* index in the nation's export sector (Z_X). This refers to the marginal or average productivity of a factor in the export sector (Salvatore D., 2013). It measures the amount of imports the nation gets per unit of domestic factors of production embodied in its exports (Salvatore D., 2013).

$$S = (P_X / P_M)\, Z_X$$

The single factoral terms of trade concepts were introduced by Jacob Veiner (1937). The construction of the productivity index stems from Veiner willingness to provide a better guide to the trend of gain from trade. So Veiner theorized the use of an index of the cost of production in terms of the average technical coefficients of production of the export commodities, and then he multiplied the commodity terms of trade index by the commodity terms of trade index. The productivity index as formulated by Veiner (1937, pg 559) is F_0/F_1 and it reflects the factors of production used per unit of export - F_0 for the initial year and F_1 for the given year.

v. The double factoral terms of trade (*D*).
This approach tries to go behind the international exchange of commodities, to the productive factors that are "embodied" in them. The double factoral terms of trade measures how many units of domestic factors embodied in the nation's

exports are exchanged per unit of *foreign* factors embodied in its imports (Salvatore D., 2013). Veiner (1937, pg 561) refers to this index saying that this index reflects "the number of units of the productive services of the foreign country whose product exchanged for the product of one unit of the productive services of your own country".

Z_M is an *import* productivity index (Salvatore D., 2013). Hence, if units are chosen so that for example 1 unit of labour in UK produce 1 unit of cloths, and 1 unit of labour in Portugal produces 1 unit of wine, commodity terms of trade of 5 wines to 1 cloth would mean that a unit in UK labour exchanges for 5 units of Portuguese labour in international trade (Salvatore D., 2013).

$$D = (P_X / P_M)(Z_X / Z_M)\ 100$$

The factoral terms of trade, both single and double, are of little practical importance because it is very difficult to measure statistically the changes in the productive efficiency of the factors of production (Salvatore D., 2013). It does not have much significance for developing nations and is very seldom, if ever, measured (Salvatore D., 2013).

The most significant terms of trade for developing nations are *N, I* and *S* (Salvatore D., 2013). However, since *N* is the easiest to measure, most of the discussion in the economic literature has been in terms of *N*. Moreover, the commodity terms of trade is continuously measured for most of the countries in the world by international agencies such as International Monetary Fund, World Bank and the United Nations, where N, indeed, is often referred to simply as "the terms of trade" (Salvatore D., 2013).

It deserves to be underlined that *I* and *S* can rise even when *N* declines (Salvatore D., 2013). This is generally regarded as favorable to a developing nation. Of course, the most favorable situation is when *N*, *I*, and *S* all increase (Salvatore D., 2013). On the other hand, the worst possible situation from the point of view of a developing nation occurs when all three terms of trade deteriorate (Salvatore D., 2013).

1.3 General Mechanism of Terms of Trade and Factors of Influence

Since the terms of trade are the price relationship between a country's exports and imports, therefore they will be influenced by all the factors that determine the prices of imports and exports: mainly fluctuations in exchange rates and commodity prices volatility. Moreover also the following factors impact on the terms of trade: elasticity of demand and supply, competitive condition, tastes and preferences, tariffs and quotas and economic development.

The effect of a change in the world price of a commodity on the value of a country's exports and imports, as a percent of GDP, is determined by the Terms of Trade Effect.

In order to calculate the effect the needed Data Requirements are: value of exports and imports of a commodity, proportional change in world price of exports and imports over time, GDP (Food Security Portal, 2018).

Terms of Trade Effect = $$\frac{\left[\sum xi\left(\frac{\Delta pi}{pi}\right)-\sum mi\left(\frac{\Delta pi}{pi}\right)\right]}{GDP}$$

Variables:

i Commodity

xi Value od Export i

mi Value of Import i

$\Delta pi / pi$ Proportional change in the world price of export or import i, depending on if it is preceded by x (exports) or m (imports).

GDP Gross Domestic Product

The analysis can be applied to individual commodities or to broad categories (Food Security Portal, 2018).
In the short-term, changes in relative prices of imports and exports are caused principally by fluctuations in exchange rates (Cherunilam F., 2008). A depreciation in the exchange rate will increase import prices, worsening terms of trade (Cherunilam F., 2008). This will deteriorate the trade balance, since for every unit imported, a greater number of exports would be required (Cherunilam F., 2008). An exchange rate appreciation has the opposite effect: improving the terms of trade and making imports cheaper so fewer exports are required per unit of import (Cherunilam F., 2008).

The elasticity of demand for exports and imports, and of supply of exports and imports of a country significantly influence its terms of trade (Cherunilam F., 2008). When the demand for the country's exports is less price elastic, as compared to her imports, the terms of trade tend to be favorable because under such a situation exports can command a relatively higher price than imports (Cherunilam F., 2008). On the other hand, if the demand for imports is less elastic than that for exports, the terms of trade tend to be unfavorable (Cherunilam F., 2008).
If the supply of a country's export is more elastic than the imports, the terms of trade is likely to be favorable because by contracting and expanding the supply of export in accordance with the market conditions it may be possible to have some control over export prices (Cherunilam F., 2008).

Competitive conditions in the international market are another important influence on the terms of trade (Cherunilam F., 2008). If the country enjoys monopoly or oligopoly power in case of the goods it exports and there are a large number of alternative sources of supply of imports, the country would have a favorable terms of trade (Cherunilam F., 2008). The absence of close

substitutes enables a country to sell its products at high prices. It has been the almost monopoly power enjoyed by the oil cartel that enabled the OPEC to improve their terms of trade by hiking the oil prices (Cherunilam F., 2008).

Changes in tastes and preferences may also cause changes in the terms of trade (Cherunilam F., 2008). A change in the former in favor of a country's export goods could help improve its terms of trade and vice versa (Cherunilam F., 2008).
Tariffs and quotas may also affect the terms of trade of a country (Cherunilam F., 2008). The latter, if not retailed by other countries, may have the effect of improving the terms of trade under certain conditions (Cherunilam F., 2008).

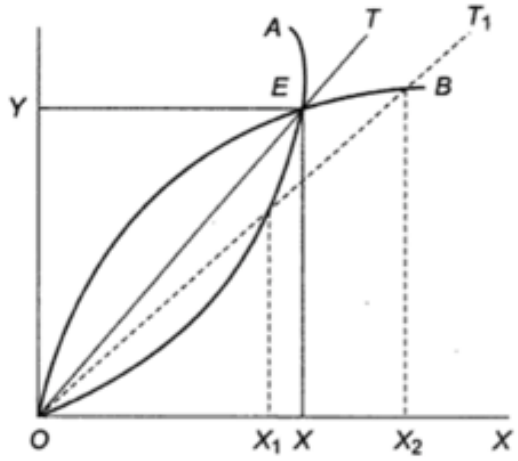
There are two important effects of economic development to be considered, namely, the demand effect and the supply effect (Cherunilam F., 2008). The demand effect refers to the increase in demand for imports as a result of the increase in income associated with economic development (Cherunilam F., 2008). The supply effect refers to the increase in supply of import competing goods or import substitutes (Cherunilam F., 2008). The net effect on the terms of trade will be obviously depend upon the extent of these effects (Cherunilam F., 2008).

1.4 Equilibrium and Changes in Demand and Supply on Terms of Trade

This paragraph is aimed to show three different situations regarding the terms of trade of two countries specialised in the trade of two goods: a) the offer curves of two countries when their terms of trade are in Equilibrium, b) the effects of changes in Demand on the Terms of Trade; c) the effects of changes in Supply on the Terms of Trade.

- Offer Curves and Equilibrium of Terms of Trade

FIGURE 1.1 EQUILIBRIUM OF TERMS OF TRADE.



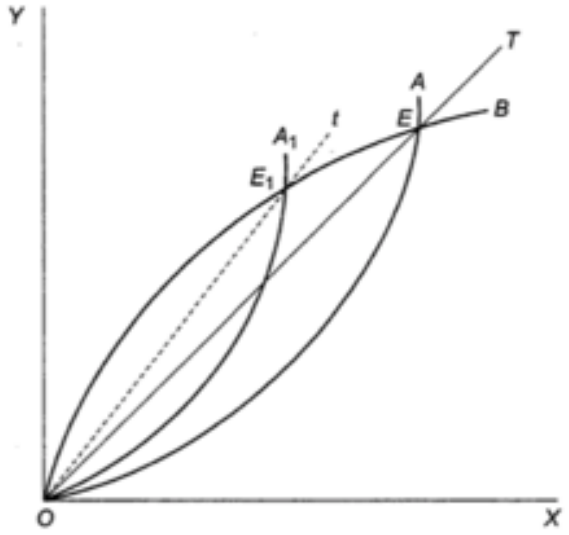
Source: Cherunilam F. (2008) pg. 182

In Figure 1.1 OA represents the offer curve of country A which specialises in the production of commodity X, and OB represents the offer curve of country B which specialises in the production of commodity Y. OT represents the equilibrium terms of trade and E the equilibrium point. When the terms of trade is OT, country A would be willing to offer OX of X and OY of Y and country B would be willing to offer OY of Y for OX of X.
Suppose that the terms of trade have changed from OT to OT_1. This shift of the terms of trade curve towards the right implies that commodity X has become cheaper in terms of Y (Cherunilam F., 2008). At the new Terms of trade, i.e. OT_1, country B will demand OX_2 of X, but country A would be willing to supply only OX_1 of X (Cherunilam F., 2008). Thus, at OT_1 Terms of trade, there is an excess demand for X equivalent to X_1X_2. This excess demand would tend to drive the price of X upwards (Cherunilam F., 2008). As the price of X increases, its supply would also tend to increase (Cherunilam F., 2008). These changes would have the effect of re-establishing the equilibrium (Cherunilam F., 2008).

- Effect of changes in Demand on Terms of Trade

A change in Demand for a commodity, will change the Equilibrium Terms of Trade.

FIGURE 1.2 EFFECTS OF CHANGES IN DEMAND ON TERMS OF TRADE.



Source: Cherunilam F. (2008) pg. 183

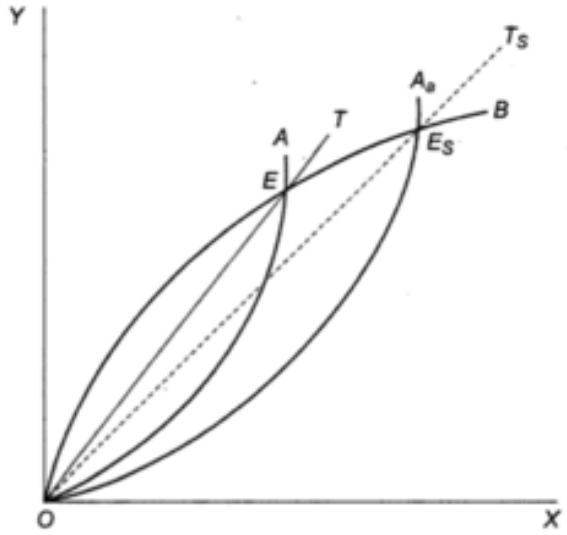
In Figure 1.2, assume that OT is the original terms of trade and E the corresponding equilibrium point, established by OA, the offer curve of country A producing, X and OB, the offer curve of country B producing Y (Cherunilam F., 2008).
Suppose that the demand for X increases in Country A, causing an increase in its price (Cherunilam F., 2008). This increase in price will shift the offer curve of

country A towards the left implying that now country A will have to be offered more Y to make it part with any given amount of X (Cherunilam F., 2008).
Suppose that as a result of the change in demand for X and the concomitant increase in price, the offer curve of country A shifts from OA to OA_1. Then E_1 will emerge as the new equilibrium point and Ot the corresponding equilibrium terms of trade (Cherunilam F., 2008).
It is quite clear from the figure that the shift in country A's offer curve to the left has caused a decline in the volume of international trade (Cherunilam F., 2008). This is natural because as the domestic demand for X increased in country A, the amount of X now available and offered for exports has also reduced (Cherunilam F., 2008). As exports pay for imports, lower exports of X would also mean lower imports of Y (Cherunilam F., 2008).

- Effect of Change in Supply on Terms of Trade

Suppose that due to an advance in technology, the output of X increases in country A. Ceteris paribus, this increase in the supply of X will cause a fall in its price and a shift in the offer curve of country A towards the right as shown in Figure 1.3.

FIGURE 1.3 EFFECTS OF CHANGES IN SUPPLY ON TERMS OF TRADE.



Source: Cherunilam F. (2008) pg. 184

This shift of the offer curve from OA to OA_a implies that now country A is willing to offer a larger quantity of X than before, for any given amount of Y (Cherunilam F., 2008). E_s is the new equilibrium point and OT_s the corresponding equilibrium terms of trade (Cherunilam F., 2008).
This change in the terms of trade do not need to result in a loss to country A because if the increase in the supply of X is caused by a technology advance, it could reduce the cost of production of X (Cherunilam F., 2008). It could be even possible that at the new exchange ratio, though unfavourable compared to the original one, country A is gaining more now for the sacrifice involved in producing any given amount of X (Cherunilam F., 2008).

The figure shows that the increase in the supply of X and the fall in its price leads to an expansion of international trade (Cherunilam F., 2008). This is natual beacuse at the lower price of X, country B would demand more X and would demand and import more X by exporting more Y (Cherunilam F., 2008).

1.5 Deterioration in the Terms of Trade of Developing Nations

Economists as *Prebisch* (1962)*, Singer* (1950), and *Myrdal* (1959), have argued that international market forces caused a secular deterioration in the *commodity terms of trade* of developing nations and thereby transferred incomes from the poor to the rich nations. The views of Prebisch and Singer are jointly known as the "Prebisch-Singer hypothesis". Here it is presented a a brief discussion on the Prebisch-Singer hypothesis including the reasons for the alleged deterioration in the terms of trade.

• Prebisch-Singer Hypotesis

Prebisch and Singer have based their terms-of-trade deterioration thesis on a United Nations study conducted in 1949 titled *Relative prices of Exports and Imports of Underdeveloped Countries*. The study showed that the UK's commodity terms of trade index[2] vis-à-vis its trading partners from the developing world increased from 100 in 1870 to 170 in 1938 (Dwivedi D. N., 2013). Since UK exported manufactured goods to developing nations and imported primary goods (food and row materials) from them, an increase in its commodity terms of trade index means a deterioration in the commodity terms of trade of developing nations (Dwivedi D. N., 2013)[3].
The deterioration of the terms of trade in developing countries is attributed to two factors mainly. The first reason is that most or all of the productivity increases that take place in developed nations are passed on to their workers in the form of higher wages and income, while most or all of the productivity increases that take place in developing nations are reflected in lower prices (Salvatore, 2013). The very different response to productivity increases in developed and developing nations is due to the widely differing conditions in their internal labor markets (Salvatore, 2013). Specifically, because labor is relatively scarce in developed nations and labor unions are strong, most of the productivity increases in developed nations are extracted by labor in the form of higher wages, leaving costs of production and prices more or less unchanged (Salvatore, 2013). On the other hand, because of surplus labor, large unemployment, and weak or nonexistent labor unions in most developing nations, all or most of the increases in productivity taking place in these nations are reflected in lower production costs and in lower prices for their agricultural

[2] Defined as (P_X / P_M) 100 where P_X is the export price and the import price is P_M

[3] For further information: United Nations (1949), Department of Economic Affairs, *Relative Prices of Export and Imports of Underdeveloped Countries* 7, 13-24.

exports (Salvatore, 2013). It is because productivity increases are reflected in higher wages in developed countries but in lower prices in developing countries that, according to *Prebisch* (1962), *Singer* (1950), and *Myrdal* (1959), we can expect a secular deterioration in the collective terms of trade of developing nations (Salvatore, 2013).
Another reason for expecting the terms of trade of developing nations to deteriorate is the higher income-elasticity of demand for manufactured goods (Dwivedi D. N., 2013). The demand for the manufactured exports of developed nations tends to grow much faster than the demand for the agricultural and raw material exports of developing nations (Salvatore, 2013). This is due to the much higher income elasticity of demand for manufactured goods than for agricultural commodities and raw materials (Salvatore, 2013). Therefore, an increase in income in developing countries creates more demand for manufactured goods whereas a rise in incomes in developed nations creates little or no additional demand for primary goods (food and raw materials) (Dwivedi D. N., 2013). The higher demand for manufactured goods helps to increase the price of such a good, whereas the lower demand for primary goods keeps their prices low (Dwivedi D. N., 2013). The ultimate result is a deterioration in the terms of trade of developing nations exporting primary goods (Dwivedi D. N., 2013).

• Further Empirical Evidences

The Prebisch-Singer hypothesis triggered several other empirical studies which were aimed at measuring the commodity terms (Dwivedi D. N., 2013).
One such study was carried out by Kindleberger (1956), who estimated the terms of trade of developing nations vis-à-vis European countries for 1870 and 1952. By selecting 1952, a relatively normal year, he avoided the depression year of 1938 - used in the UN study, but he could not account for qualitative changes in manufactured goods (Dwivedi D. N., 2013). Kindleberger concluded that the decline in the terms of trade of developing nations between 1870 and 1952 happened and was moderate (Dwivedi D. N., 2013).

Lipsey (1963) made a similar study of the terms of trade of developing nations in trade with the United States from 1880 and 1960. He found that there was no continuous decline in the terms of trade of developing nations (Dwivedi D. N., 2013). The terms of trade of developing countries vis-à-vis the US had, in fact, risen before World War I and between World War II and 1952, and declined thereafter (Dwivedi D. N., 2013).

Another study of the terms of trade between UK developing nations was carried out by Spraos (1983), by making adjustments for the cost of transportations and quality improvements (Dwivedi D. N., 2013). He confirmed that the terms of trade of developing nations did deteriorate between 1870 and 1938 (Dwivedi D. N., 2013). However, he found major deterioration in developing nations' terms of trade in the post World War II period till 1970.

The most comprehensive and convincing study of the terms of trade was carried out by Grilli and Yang (1988) for the Wolrd Bank. It found that the terms of trade between primary products and manufactured goods deteriorated at the rate of 0,6 per cent per annum between 1900 and 1986 (Dwivedi D. N., 2013). Grilli and Yang's study confirmed the findings of the UN study (Dwivedi D. N., 2013).

CHAPTER 2 - GLOBAL MARKET OF ENERGY

Global energy markets are affected by several counteracting development trends (Statoil, 2017). This chapter opens with an overlook about the world energy: it explains how the global power source quotas are distributed highlighting the most significant shifts happened in 2016, and it lists the main factors that boost global energy demand. Then the chapter proceeds with a focus on the two types of energy on the market nowadays: fossil energy and renewables. Specific attention will be given to oil market, since it is particularly relevant for the main purpose of this thesis.

2.1 Global Energy: Stylized Facts

The U.S. Energy Information Administration's latest International Energy Outlook 2017 (IEO, 2017) projects that world energy consumption will grow by 28% between 2015 and 2040. Most of this growth is expected to come from countries that are not in the OECD[4], and especially in countries where demand is driven by strong economic growth, particularly in Asia – Figure 2.1 (Energy use refers to use of primary energy before transformation to other end-use fuels, which is equal to indigenous production plus imports and stock changes, minus exports and fuels supplied to ships and aircraft engaged in international transport).

Non-OECD Asia, which includes China and India, accounts for more than 60% of the world's total increase in energy consumption from 2015 through 2040 (IEO, 2017). Moreover, Data regarding energy consumption suggests energy market is evolving. A series of macro structural changes are affecting the energy demand, while the drive towards a lower carbon future and technological innovation are affecting the fuel mix and shifting supply emphasis towards renewable energy sources (Sutorius, 2016). According to the data elaborated by the BP (British Petroleum) (2017) Statistical review of World Energy for the 2016 year, the world energy consumption quotas are distributed as shown in table 2.1.

In 2016, the most interesting data regard Oil, Coal and Renewables. Oil remains the world’s dominant fuel, representing a third of all energy consumed and increasing its global market share. Coal, the second dominant fuel, is the only power source that lost a percentage of market share. This is mainly due to the decarbonization policies activated in several countries – China included - with the aim to reduce greenhouse gases emissions, and it highlights the fact that the energy mix is shifting towards cleaner, lower carbon fuels, driven by both environmental needs and technological advances. The influence of the energy transition is particularly marked in the contrasting fortunes of coal and

[4] List of OECD 35 Members Countries: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Isreael, Italy, Japan, Korea, Latvia, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switerland, Turkey, United Kingdom, United States.

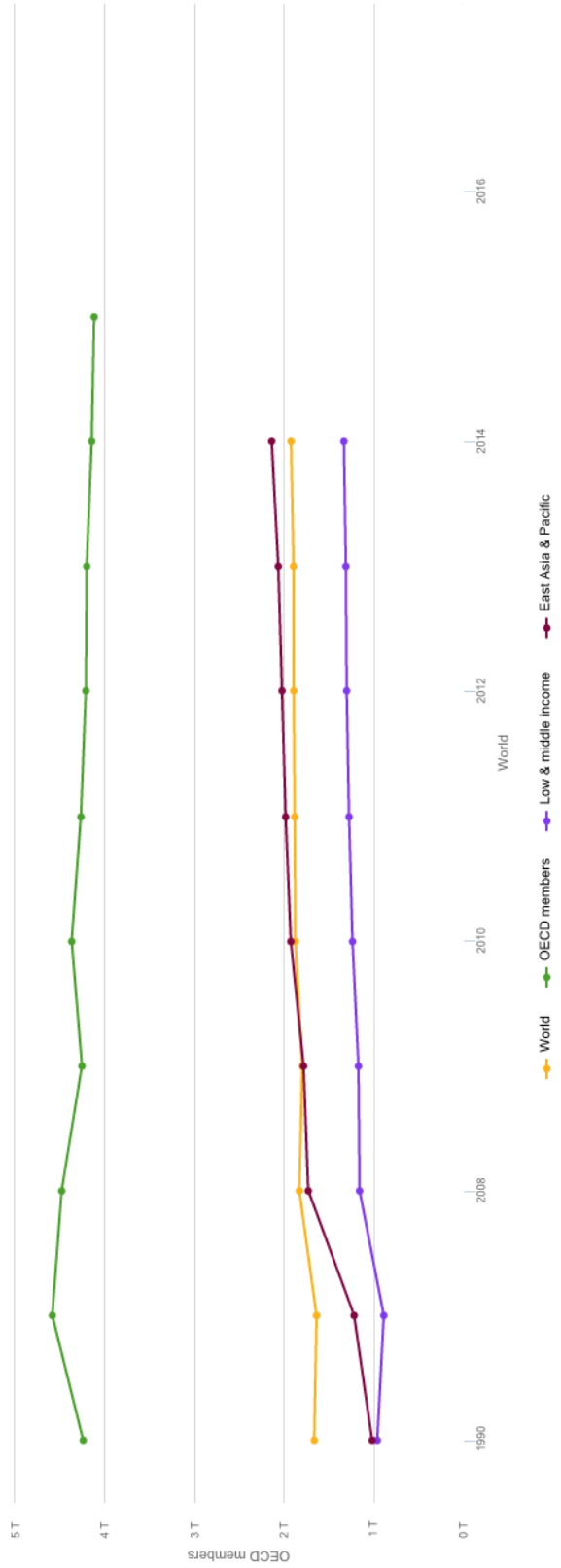
renewable energy (BP, 2017). In fact, although the share of renewable energy within total energy remains small, it grew strongly, helped by continuing technological advances, especially in solar and wind power. Natural Gas increase is a bit weak since global production was essentially flat (BP, 2017)

TABLE 2.1- WORLD PRIMARY ENERGY CONSUMPTION QUOTAS BY POWER SOURCE (2016)*

Power Source	World Quotas (in million tonnes of oil equivalent)	% of The Total	% Of Growth From The Previous Year
Coal	3 732.0	28,11	-1,39
Natural Gas	3 204.1	24,13	1,82
Oil	4 418.2	33,28	1,77
Nuclear Energy	592.1	4,46	1,61
Hydro-Electricity	910.3	6,86	3,06
Renewables	419.6	3,16	14,42
World Total	13 276.3	100	

**Note: Oil consumption is measured in million tones; other fuels in million tonnes of oil equivalent. The last column on the right highlights the percentage of growth in the utilization of each type of energy in 2016, compared to 2015, which is the previous year.*
Data Source: BP, 2017.

FIGURE 2.1 ENERGY USE (KG OF OIL EQUIVALENT PER CAPITA)



Source: Author's elaboration on World Development Indicators Databank tool (2018).

Looking at the picture overall, the *World Energy Outlook 2017*[5] argues that the following five general factors will determine the features of the future global energy market trends: economic growth, demographic trends, environmental agreements and policies, technological developments, geopolitics and regional conflicts. Below a brief analysis per each factor.

i) Economic growth.

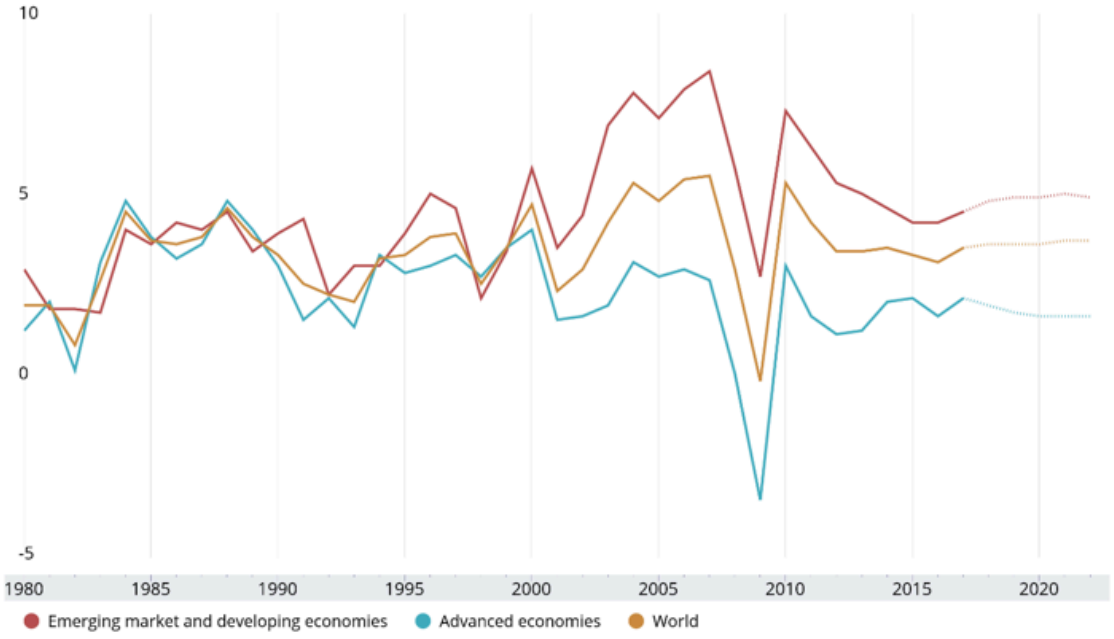
From a microeconomic perspective, economic growth needs energy as a fundamental element, since production is a function of capital, labor, and energy (Stern, 2010). Economic growth requires the availability of energy, but the nature of their relationship is complex, since the way that economic growth translates into energy demand varies substantially by country, depending on each country's economic structures and stages of development, as well as pricing and efficiency policies (IEA, 2017c).
Dividing the world into advanced economies on the one hand, and emerging markets and developing countries on the other, Figure 2.2 shows different real GDP growth patterns per each groups. In emerging low and middle income economies the real GDP growth forecast is above the world average. In these countries economic expansion is so extremely rapid that it has much stronger implications for energy demand, especially since energy-intensive industrial activity accounts for a larger share of GDP (IEA, 2017c). This fact largely contributes to boost the growth in energy consumption (IEA, 2017c). In fact, looking back at Figure 2.1, it is easy to see that low and middle income countries' trend in energy use is slowly rising. In addition, non-OECD countries show a ratio of primary energy demand growth to GDP growth of 0.62 (Data from IEA, 2017c). On the contrary, in developed economies the real GDP growth is above the world average, with a slow decreasing forecasted trend as well - Figure 2.2 – and, despite they are the largest energy consumers, their ratio of primary energy demand growth to GDP growth is of 0.32. In addition to the economic expectations of only moderate economic growth, an energy use closely related to growth in the modern sectors (industry, motorized transport, and urban areas), increasing opportunities based on renewable technology to reduce energy intensities, and strong interest in smart cities, smart grids, electric vehicles, carpooling, etc., constitute the basic factors that shape the declining energy use trend in such developed economies - Figure 2.1 (IEA, 2017c).

ii) Demographic trends.

Population growth impacts on energy demand. According to the most recent United Nations population data (UN, 2017a), the relative demographic weight of the world's industrialized nations is forecasted to decline by at least 25%, with a corresponding shift of economic power to developing nations. As these countries move from scarcity to relative affluence, there is a fundamental shift

[5] Source: International Energy Agency (2017)

FIGURE 2.2 REAL GDP GROWTH (ANNUAL PERCENT CHANGE)



Source: International Monetary Found (2017).

from agriculture to more energy-intensive commercial enterprises (Yeager, 2012). Most of the world's expected demographic growth will be concentrated in today's poorest regions, generally characterized by the lack of employment, capital, and educational opportunities (Yeager, 2012). In fact, according to the forecasts of UN Population Division, in 2050 the population in developing countries like Indonesia, Nigeria and Pakistan, is expected to exceed 300 million (UN, 2017a). Moreover, the majority of the world's population is becoming urbanized: an increasing share of the global population is living in cities and towns, and the global urbanization rate is projected to rise from 54% in 2016 to 63% in 2040 (IEA, 2017c). In absolute terms, this means an extra 1.7 billion people added to the urban population over the next 25 years (IEA, 2017c). In the world's poorer regions are situated some of the hugest urban centers, where the access to energy is most often a serious economic limitation (Yeager, 2012). All these shifts may result in a substantial energy demand growth in emerging countries, where energy production systems are typically underdeveloped and, therefore, in open sizable prospects for an effective energy system transformation (Yeager, 2012).

iii) Environmental Agreements and Policies.

As environmental problems becomes out-of-boundaries and more regional and global issues, the international environmental agreements has received rapidly increasing attention. According to the UN Environment Programme the current situation is a "treaty congestion". After trade, environment is now the most

common area of global rule-making (Vidal, 2012). Multilateral environmental agreements[6], despite considered as foundamental frameworks for global efforts in fighting environmental problems, sometimes present some critical issues. The main argued criticality is the lack of legally binding about the objectives that the agreements aim to achieve (Bodansky, 2015). In general, international institutions such as the COP (Conference of Parties[7]) make decisions which are not legally binding unless their governing instrument so provides (Bodansky, 2015). Anyway, agreements might contain a mix of mandatory and hortatory provisions related to parties' nationally determined contributions (NDCs) in order to achieve a specified target (Bodansky, 2015)[8]. For instance, it might include commitments that parties keep report on, and update their NDCs throughout the duration of the agreement, but make the achievement of NDCs only hortatory (Bodansky, 2015). The critic doubt is what specific obligations, if any, parties will have with respect to their NDCs – and, whether these obligations will be exclusively procedural or also substantive in character (Bodansky, 2015). The Paris Agreement is one of the most important example of multilateral agreement regarding environmental issues: it specifies both a framework within which the identified climate change measures are to be taken and the core elements of such measures (Gupta and Arts, 2017). Anyway, the agreement is not binding countries to their targets (Gupta and Arts, 2017)[9]. What is remarkable about the deal, is that it embodies an innovative, more flexible governance approach: a hybrid of hard, soft and non-law, bottom-up and top-down mechanisms (Wolfe, 2016). All countries formulate targets according to their own judgment, which means that, unlike antecedent international climate treaties, the agreement does not set mitigation targets for specific states (Wolfe, 2016). Aa a result, this new approach has made the Agreement more inclusive than any former climate deal, however, its success will depend mainly on whether parties will submit increasingly ambitious rewriting of their nationally determined contributions (Wolfe, 2016). Despite this major political success, whether the Paris Agreement will be successful in keeping temperatures below the 2°C level eventually depends also on the presence of a mix of enabling factors, including complementary national mechanisms, stable reviewing instruments, critical long-term planning, redirection of financial flows to decarbonize the economy,

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6 Main environmental agreements: a) Climate change: United Nations Framework Convention on Climate Change (1992), Kyoto Protocol (1997), Paris Agreement (2016); b) Environmental Protection: Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic (2016); c) Ozone layer: Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (1999); UNECE Protocol on Strategic Environmental Assessment (Protocol on SEA, 2003), European Landscape Convention (2000).

7 For further information: cop21paris.org (2015)

8 For further information: Bodansky D. (2015) pg 155-165

9 To enter into force, at least 55 countries representing at least 55% of global emissions had to deposit their instruments of ratification. On 5 October 2016, the conditions for the entry into force were met and the Agreement entered into force on 4 November 2016. 146 Countries ratified the Agreement in 2016, 46 signed the agreement, 3 countries did not signed and/or withdrew the agreement, including the United States.
For further information regarding the Paris Agreement: European Commission (2017).

and mobilisation of non-state actors (Wolfe,2016). In this direction, a push towards renewable energy and energy efficiency's increasingly vital role in the rapid transformation of the energy sectors of industrialized, emerging, and developing countries continues to be stimulated by government actions to incentivize new technology development and deployment (UN, 2017b). The quest of secure, fairly–priced and environmentally friendly energy sources remain the core element shaping the international energy agenda (Kottari, 2016). Policymakers have adopted a mix of policies and targets to deploy renewable energy and energy efficiency to expand energy access, provide more reliable energy services, and meet growing energy demand, while often simultaneously seeking to advance research and development into more advanced fuels and technologies (UN, 2017b)[10].

iv) Technological development.

Any study on future energy developments needs to bear in mind the role of technology. Technology moves so rapidly that new approaches or ideas can emerge within short timescales (BP, 2017). This is especially evident in the energy world where the evolution of established technologies, coupled with the increasing influence of digital innovation, together with customer demand and government policies, are changing the way companies operate (BP, 2017). Technological trends are important not only for technical efficiency in supply and consumption, but also for industrial structures and for the design of regulatory regimes and policy. If the trend towards clean technologies continues at today's rapid pace, this would represent a major force for radical changes to the structure of the energy sector (Roland, 1998). Currently, some of the renewable energy technologies i.e. hydropower, wind energy, solar energy, biomass energy, biofuels and geothermal energy are now mainstream and contributing towards the safety of the planet earth and its living creatures (Hussain, 2017). Apart from these technologies, there are some new renewable ones which are equipotential and sustainable for countering the greenhouse gasses and air pollution risks to the earth (Hussain, 2017). These emerging new technologies group comprises of marine energy, concentrated solar photovoltaics (CSP), enhanced geothermal energy (EGE), cellulosic ethanol, and artificial photosynthesis (AP), and many more (Hussain, 2017). Ultimately, digitalization could allow for further cost reductions both on the supply and demand side (Statoil, 2017).

v) Geopolitics and regional conflicts.

Recent events and longer-term developments in geopolitical tensions have had a powerful impact on energy security and access (World Economic Forum, 2016). The struggle over energy resources has been a conspicuous factor in many recent conflicts, including the Iran-Iraq War of 1980-1988, the Gulf War of 1990-1991, and the Sudanese Civil War of 1983-2005 (Klare, 2014). As these

[10] For further information: Elizondo, Luiz, Barroso (2011).

conflicts and others like them suggest, fighting for control over key energy assets or the distribution of energy revenues, especially oil and gas revenue, is a critical factor in most contemporary warfare (Klare, 2014). While ethnic and religious divisions may provide the political and ideological fuel for these battles, it is the potential for getting oil profits that keeps the struggles alive (Klare, 2014). Energy plays a very significant role in the current conflicts in Iraq, Syria, Nigeria, South Sudan, Ukraine, the East and South China Seas where oil and gas are the most important and valuable commodities and constitute a major source of income for the governments and corporations that control their production and distribution (Klare, 2014). Whoever controls these states, or the oil and gas producing areas within them, also controls the collection and allocation of crucial revenues (Klare, 2014). Moreover, the control over oil and gas resources, and their means of delivery, translates into geopolitical clout for some and economic vulnerability for others (Klare, 2014). Because so many countries are dependent on energy imports, nations with surpluses to export – including Iraq, Nigeria, Russia, and South Sudan – often exercise disproportionate influence on the world stage (Klare, 2014). What happens in these countries sometimes matters as much to the rest of the world as to the people living in them, and so the risk of external involvement in their conflicts – whether in the form of direct intervention, arms transfers, the sending in of military advisers, or economic assistance – is greater than almost anywhere else (Klare, 2014). Remarkable are the words spoken by Robert E. Ebel, Director of the Energy Program at Center for Strategic and International Studies in the U.S. Departement of State, during the Remarks to the Open Forum Washington, DC April 30, 2002:

"*Oil fuels more than automobiles and airplanes, oil fuels military power, national treasuries, and international politics. It is a determinant of well being, of national security, and international power for those who possess this vital resource, and the converse for those who do not*."

2.2 Fossil Energy Sources

Fossil energy sources, including oil, coal and natural gas cover around the 85% of world energy needs. They are non-renewable resources that formed when prehistoric plants and animals died and were gradually buried by layers of rock. Different types of fossil fuels formed over millions years, depending on the combination of organic matters, temperature, pressure conditions and their duration as time passed (Energy.Gov, 2018).
Today, fossil fuel industries drill or mine for these energy sources, burn them to produce electricity, or refine them for use as fuel for heating or transportation, over the past 20 years, nearly three-fourths of human-caused emissions came from the burning of fossil fuels (Energy.Gov, 2018).

2.2.1 Coal Overview

Coal first documented use is dated 4000BC in China, where objects were carved from black lignite, which is one of the different conformations of coal (Golas,1999). The coal life-cycle consists of three major steps: 1) coal mining and processing, 2) transportation, and 3) use/combustion (Jaramillo, 2007); its large-scale combustion period is correlated with the years around the beginning of the Industrial Revolution (Ritchie and Roser, 2018).
The fortunes of coal appear to have taken a decisive break from the past, in fact global coal demand dropped for a second year in a row in 2016 (Sadamori, 2017). According to the data elaborated by BP (2017) *Statistical review of World Energy* for the 2016 year, the Coal overlook for Production, Consumption, Net Exporters and Net Importers:

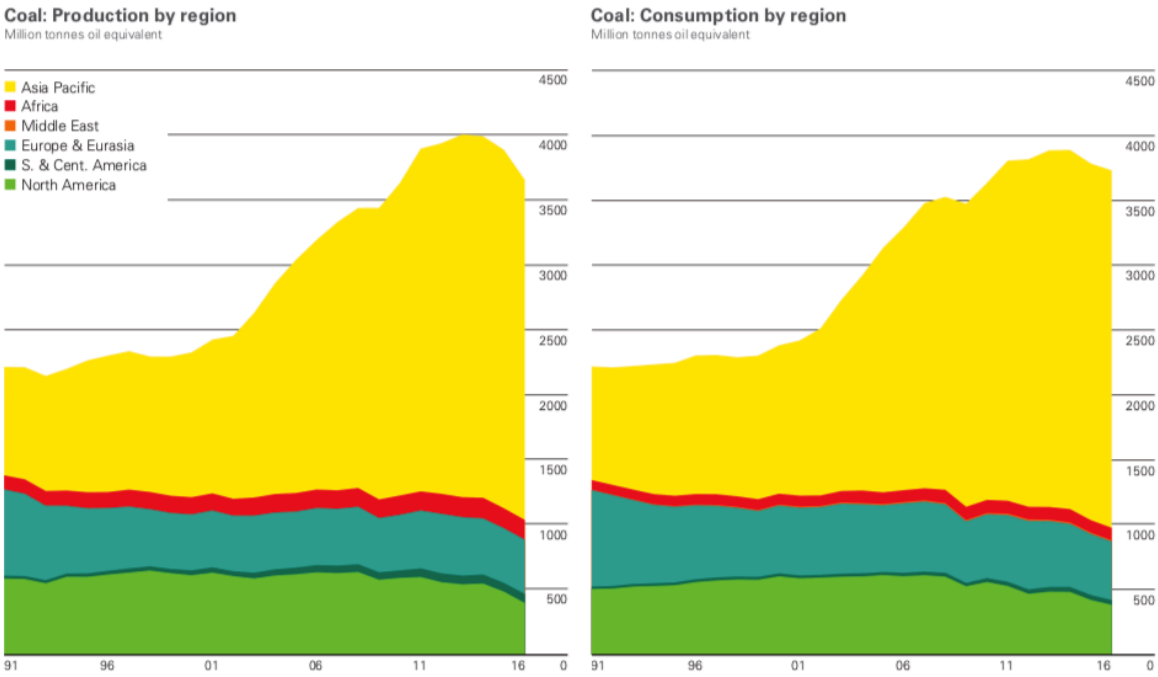
TABLE 2.2 COAL PRODUCTION AND CONSUMPTION (2016)*

Top 5 Producers	Production (million tonnes oil equivalent)	Growth Rate	Share of world production
China	1 685.7	-7,9%	46,1%
US	364.8	-19%	10,0%
India	288.5	2,4%	7,9%
Indonesia	255.7	-6,2%	7,0%
Russian Federation	192.8	3,1%	5,3%
Total world	3 656.4	-6,2%	100%

Top 5 Consumers	Consumption (million tonnes oil equivalent)	Growth rate	Share of world consumption%
China	1 887.6	-1,6%	50,6%
India	411.9	3,6%	11,0%
US	358.4	-8,8%	9,6%
European Union	238.4	-8,9%	5,3%
Japan	119.9	-0,2%	3,2%
Total world	3 732.0	-1,7%	100%

**Note: commercial solid fuels only, includes coal produced for coal-to-liquids and coal-to-gas transformation. Annual changes and shares of total are calculated using million tonnes oil equivalent figures.*
Data Source: BP, 2017.

FIGURE 2.3 COAL PRODUCTION AND CONSUMPTION BY REGION



Source: BP 2017, pg. 40.

TABLE 2.3 NET EXPORTERS AND NET IMPORTERS OF COAL (2016)*

Top 5 Net Exporters	Export (in million tonnes oil equivalent)	Top 5 Net Importers	Import (in million tonnes oil equivalent)
Australia	389	China	247
Indonesia	367	India	199
Russian Federation	147	Japan	189
Colombia	83	Korea	134
South Africa	76	Chinese Taipei	66
Total world	1 213		1 211

**Note: It includes steam coal, coking coal, lignite and recovered coal.*
Source: IEA, 2017.

As data unequivocally suggest, Asian countries are the largest producers, consumers and importers of coal. Among Asian nations, China and India have a standout role. China is the leader country in the production, consumption and import of coal. However, Chinese growth rate both for production and consumption are negative: improving air quality has become a major policy priority in the country, which at the beginning of the 2016 introduced a series of measures to reduce capacity among the smallest, least productive mines (BP,

2017). In addition, China's National Development and Reform Commission (NDRC) ordered coal mines to produce on a 276-day basis (from 330 days) (World Bank, 2017a). The objective was to reduce production by 16 percent and raise prices to 500-570 yuan per ton (roughly equivalent to $66-$75/t for the Australian spot price) (World Bank, 2017a). As prices spiked, China relaxed the 276-day rule in November 2016, and has encouraged producers to raise production to push prices back down into its targeted range. Nevertheless, the NDRC intends to reduce overcapacity and ensure mine safety (World Bank, 2017a).

India is the second consumer and importer country, with a growing fleet of coal power plants running at less than 60% of capacity and robust power demand growth, coal-fired generation is forecast to increase at nearly 4% per year through 2022 (IEA, 2017a). Outside the power sector, growth in thermal coal demand is centred in the industrial sector thanks to robust economic growth, as well as in coking coal, thanks to rising steel consumption, housing, railways and steel-intensive industries such as shipbuilding, defense and vehicle manufacturing (IEA, 2017a).

Despite the US is among the top producers and consumers countries, it is interesting to notice the strong decline in both production and consumption. Mines in the United States continued its declining trend in 2016, falling to 710 mines, which is 16.8% fewer mines than in 2015 (EIA, 2017a). This is essentially due to the U.S. shale boom, that has allowed domestic natural gas prices to fall steadily since 2008 (Popa, 2016). With the gap between coal and natural gas prices narrowing, utilities are taking advantage of low gas prices and using more natural gas to generate electricity.

Regarding Europe, among the top consumers, prospects for coal are bleak throughout most of the countries. The future of coal in Europe looks at Poland and Germany, which account for more than half of the coal consumed in the EU, for most of the other countries coal is increasingly becoming a negligible part of the energy mix (IEA, 2017a). A particularly striking example of this long-run movement away from coal was in the UK, where its relationship with coal almost completed an entire cycle: with the UK's last three underground coal mines closing, consumption falling back to where it was roughly 200 years ago around the time of the industrial revolution, and the UK power sector recording its first ever coal-free day in April of 2017 (BP, 2017).

It deserves to be mentioned that managing coal resources can lead both to socio-economic benefits and environmental concerns. Firstly, benefits are typically related to the infrastructures development in distant rural areas, where roads or rail needs to be built for the transfer of coal (World Energy Council, 2016). Obviously, the infrastructure development impacts the most in under-developed and developing nations due to the absence of pre-existing net of infrastructures (World Energy Council, 2016). On the other hand, concerns are related to the land close to mining areas and to emissions that the mining activities provoke. The environmental challenges from coal mining include coal mine accidents, land subsidence, damage to the water environment, mining

waste disposal and air pollution (Bian, 2010). Several big issues due to pollution happened in Witbank-Middelburg mining area in South Africa, and in China[11].
However, the overall global trend regarding the use of coal is declining, in favour of other more modern energy sources, mainly do to a combination of two factors: the increasing availability and competitiveness of natural gas and renewables on one side, and the with government and societal pressure to shift towards cleaner, lower carbon fuels on the other.

2.2.2 Natural Gas and Liquified Natural Gas Overview

Natural gas is a resource extracted from wells and sent to processing plants where water, carbon dioxide, sulfur, and other hydrocarbons are removed (Jaramillo, 2007). The produced natural gas then enters the transmission system, and from the transmission and storage system, some natural gas goes directly to large-scale consumers, like electric power generators (Jaramillo, 2007). The rest goes into local distribution systems that deliver it to residential and commercial consumers via low-pressure, small-diameter pipelines (Jaramillo, 2007). The use of liquefied natural gas (LNG), instead, adds three additional life-cycle stages to the natural gas life-cycle described above. Natural gas is produced and processed to remove contaminants and transported by pipeline relatively for short distances to be liquefied, and in the liquefaction process, natural gas is cooled and pressurized (Jaramillo, 2007). Liquefaction plants are generally located in coastal areas of LNG exporting countries and dedicated LNG ocean tankers transport the resource (Jaramillo, 2007). Natural gas is a versatile fuel and its growth is linked in part to its environmental benefits relatively to other fossil fuels, particularly for air quality and greenhouse gas emissions. It supplies 24.13% of the global energy, it is responsible for nearly a quarter of electricity generation, and covers a fundamental role as a feedstock for industry (IEA, 2017b).

As data suggest (Table 2.4), the most important players in the gas market are the United States, the Middle East with Qatar and Iran, and the Russian Federation.
The United States, both the largest producer and consumer of gas in the world, is intended to increase its gas use as well as its exports (IEA, 2017b). In fact, the US is planning to rise its production relatively more than all the other countries during the next five years: by 2022 the country output will reach 890 billion cubic meters, a quantity higher than the 22% of the total gas produced worldwide (IEA, 2017b). Although US gas domestic demand is rising due to a growing need in industry, more than the 50% of the output increase will be transformed into liquid natural gas for export (IEA, 2017b). In fact, L.N.G. export capacity is under construction to rise it from 33% to nearly 40% of the total international gas trade by 2022 (Krauss, 2017). Roughly 60% of the new L.N.G. export capacity is being built in the United States, which only began exporting

[11] For further information: Munnik Victor (2010)

large supplies last year, giving Washington a new tool for its foreign policy toolbox and raising the country to the top tier of exporters.

TABLE 2.4 NATURAL GAS PRODUCTION AND CONSUMPTION (2016)*

Top 5 Producers	Production (billion cubic meters)	Growth rate	Share of world production
US	749.2	-2,5%	21,1%
Russian Federation	579.4	0,5%	16,3%
Iran	202.4	6,6%	5,7%
Qatar	181.2	1,3%	5,1%
Canada	152.0	1,7%	4,3%
Total world	3 551.6	0,3%	100%
Top 5 Consumers	Consumption (billion cubic meters)	Growth rate	Share of world consumption
US	778.6	0,4%	22,0%
European Union	428.8	7,1%	12,1%
Russian Federation	390.9	-3,2%	11,0%
China	210.3	7,7%	5,9%
Iran	200.8	5,0%	5,7%
Total world	3 542.9	1,5%	100%

**Note: excludes natural gas converted to liquid fuels but includes derivatives of coal as well as natural gas consumed in Gas-to-Liquids transformation. Annual changes and shares of total are calculated using billion cubic meters figures. Growth rates are adjusted for leap years.*
Data Source: BP, 2017.

TABLE 2.5 NATURAL GAS NET EXPORTERS AND NET IMPORTERS (2016)*

Top 5 Net Exporters	Export (in billion cubic meters)	Top 5 Net Importers	Import (in billion cubic meters)
Russian Federation	205	Japan	116
Qatar	117	Germany	79
Norway	115	China	69
Canada	61	Italy	65
Algeria	54	Turkey	46
Total world	869		857

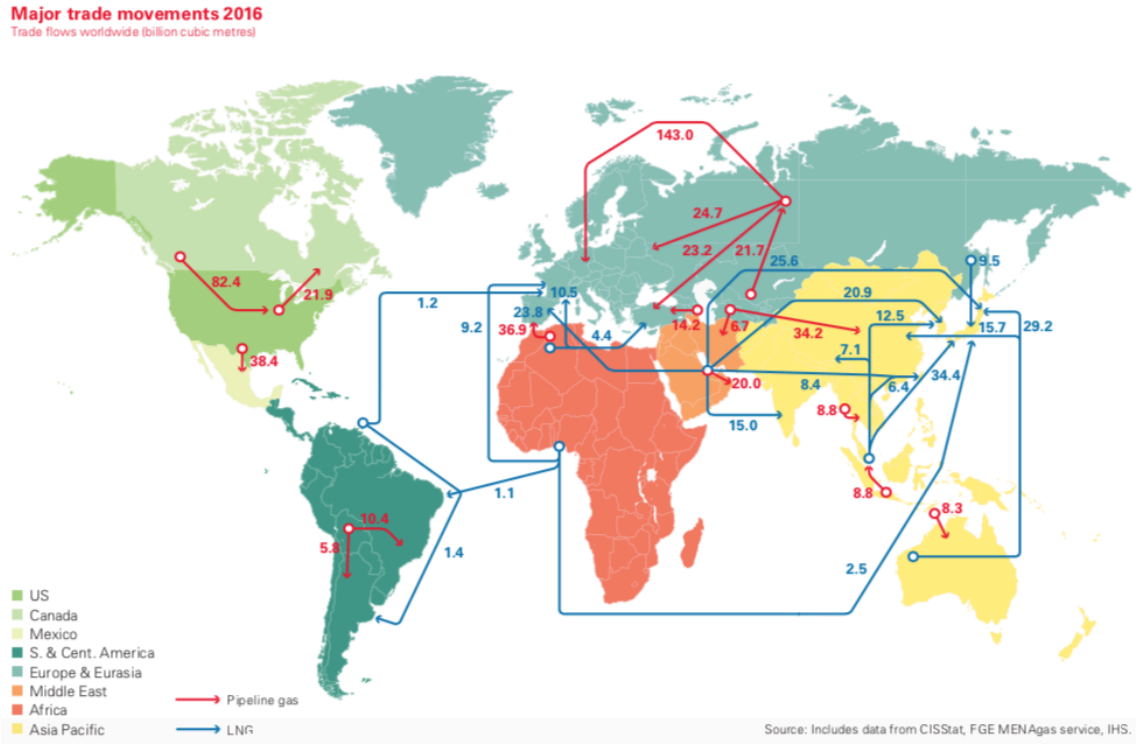
**Note: Net exports and net imports include pipeline gas and LNG.*
Source: IEA, 2017.

The Middle East was the world's largest LNG exporting region from 2010 to 2015, driven by growth in Qatari and Iranian production (IGU, 2017). This was due in large part to a substantial increase in the use of gas in the power and petrochemicals sectors (SNAM, 2017). With huge existing proved gas reserves, Qatar is able to supply more than 30% of LNG to most gas-deficit regions in the world (SNAM, 2017). However, new impending LNG supplies especially from the US, threaten Qatar's leader position (Frost&Sullivan, 2015). Iran, on the other hand, has immense gas reserves, being the second largest holder of proved natural gas reserves (Frost&Sullivan, 2015). The country's hydrocarbon development has been slow as a result of the international sanctions, which stem from Iran's nuclear program (Frost&Sullivan, 2015). Therefore, lack of foreign investment and technology has paralyzed Iran's natural gas production growth and ambition to build LNG infrastructure (Frost&Sullivan, 2015). However, in 2017 Iran consumption of gas growth stood out, with 4% growth, driven largely by greater investment and economic growth following the easing of sanctions (SNAM, 2017).

Also the Russian Federation is among the leading countries for gas production, consumption and exports. Russia's economic growth is driven by energy exports, given its high oil and natural gas production: oil and natural gas revenues accounted for 36% of Russia's federal budget revenues in 2016. Gas production in leaded by the state owned Gazprom company, which accounts for around two-thirds of the country's gas production (Simola, 2017), and exports especially in Europe. In fact, Russia and Europe are particularly interdependent in terms of energy. On one hand, Europe is dependent on Russia as a source of supply for both oil and natural gas: more than 70% of natural gas imports to to European countries – Germany Italy Turkey among the top importers - came from Russia in 2016 (EIA, 2017b). On the other hand, Russia is dependent on Europe as a market for its oil and natural gas and the revenues those exports generate.

Asia is the world's key growth market for energy consumption, and it is still building coal-fired power generation (SNAM, 2017). It will be no easy for liquid natural gas to gain share from coal in this market. Assuming coal prices remained steady, making LNG competitive with domestically produced coal for electricity generation in Asia would require a cut of 20-30% in total LNG costs, or a combination of efficiencies and policy interventions to implement a carbon price (SNAM, 2017). However, China has the potential to become a huge gas market thanks to policies like the "13th Five-Year Plan", which provides strong support for gas use, helping it to gradually replace massive use of coal in almost every industrial sector (textile, food and other types of manufacturing), as well as in power generation and household heating (IEA, 2017b). Instead, an exception among Asian countries is Japan, one of the largest LNG importer. The country imports at about 35% of global demand, it has some of the most reliable and modern gas plants in the world with nearly the 40% of its current gas power capacity constructed since 2007 (Clemente, 2016). Figure 2.6 shows the major trade movement of gas divided into gas traded through pipelines (in red) and LNG trade (in blu).

FIGURE 2.4 NATURAL GAS MAJOR TRADE MOVEMENTS



Source: Bp (2017), pg 35.

In conclusion, the global trend for natural gas energy use is increasing, mostly thanks to US shale gas boom production and its consumption in the industrial sector, where competitiveness continues to be boosted by cheap gas. European countries are among the top importers allowing gas sector to gain field even in the euro area and new environmental policies in Asian countries may have a role in helping the energy market to a slow switch from coal to gas, especially in the leader country which is China.
However, the role that natural gas can play in the future of global energy is inextricably linked to its ability to help address environmental problems. With concerns about air quality and climate change looming large, natural gas offers many potential benefits if it displaces more polluting fuels. In fact, the emissions from natural gas combustion show clear advantages for gas relative to other fossil fuels: CO_2 emissions (per unit of energy produced) from gas are around 40% lower than coal and around 20% lower than oil (IEA, 2017c).

2.3 Oil Market Overview

Oil is a commodity with particular characteristics. It covers unique roles from being the natural heritage of a country to the motor of global industrialization, it

impacts on different economies with its price volatility and consequent boom–bust cycles, it requires especially high capital intensity and technological sophistication, and provides the exceptional generation of profits that accrue to the state and to private actors. (Lynn Karl T., 2004). Crude oil is a fossil fuel composed by a mixture of hydrocarbons originated from plants and animals that lived millions of years ago, and it exists in liquid form in underground pools or reservoirs, in tiny spaces within sedimentary rocks, and near the surface (oil sands), after crude oil is removed from the ground, it is sent to a refinery where different parts of the crude oil are separated into useable petroleum products (gasoline, distillates such as diesel fuel and heating oil, jet fuel, petrochemical feedstocks, waxes, lubricating oils, and asphalt)[12]. Oil today provides the 33.28% of global energy.

TABLE 2.6 NATURAL OIL PRODUCTION AND CONSUMPTION (2016)*

Top 5 Producers	Production (in million tonnes)	Growth rate	Share of world production %
Saudi Arabia	585.7	2,9%	13,4%
Russian Federation	554.3	2,2%	12,6%
US	543.0	-4,2%	12,4%
Iraq	218.9	10,8%	5,0%
Canada	218.2	0,9%	5,0%
Total world	4 382.4	0,3%	100%
Top 5 Consumers	Consumption (in million tonnes)	Growth rate	Share of world consumption %
US	863.1	0,5%	19,5%
European Union	613.3	1,8%	13,9%
China	578.7	2,7%	13,1%
India	212.7	8,3%	4,8%
Japan	184.3	-2,8%	4,2%
Total world	4 418.2		100%

**Note: Includes crude oil, oil sands and NGLs (the liquid content of natural gas where this is recovered separately). Excludes liquid fuels from other sources such as biomass and derivatives of coal and natural gas. Annual changes and shares of total are calculated using million tonnes figures. Growth rates are adjusted for leap years.*
Data Source: BP, 2017.

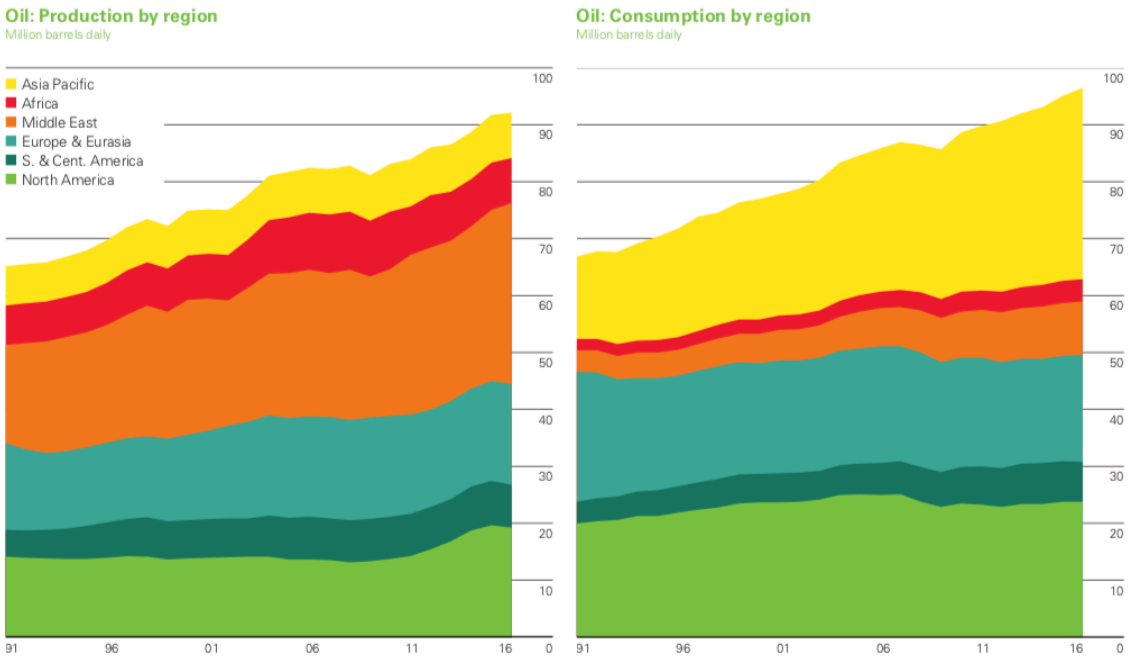
[12] See: EIA, *Oil: Crude and Petroleum Products Explained* (2017)

TABLE 2.7 OIL EXPORTERS AND IMPORTERS (2016)*

Top 5 Exporters	Export (in million tonnes)	Top 5 Importers	Import (in million tonnes)
Saudi Arabia	369	US	348
Russian Federation	243	China	333
Iraq	148	India	203
United Arab Emirates	125	Japan	165
Canada	116	Korea	139
Total world	1 992		2 041

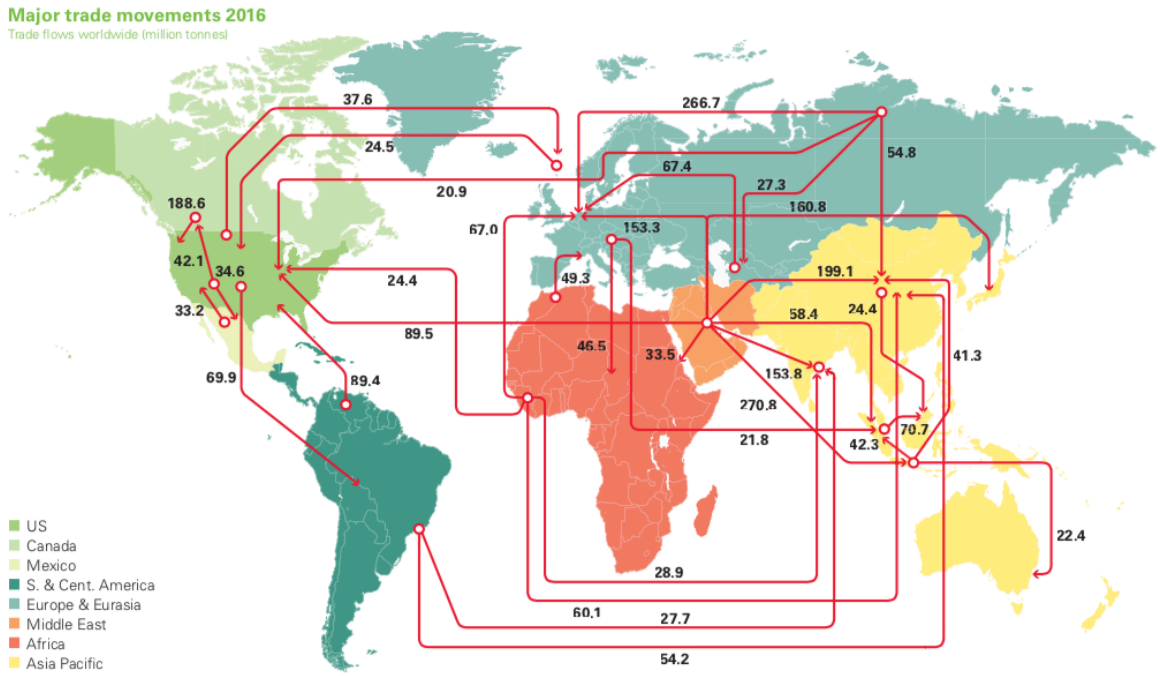
**Note: Net exports and net imports include pipeline gas and LNG. Includes production of crude oil, NGL, feedstocks, additives and other hydrocarbons. Excludes liquids from other fuel sources (renewable, coal and natural gas).*
Source: IEA, 2017.

FIGURE 2.5 OIL PRODUCTION AND CONSUMPTION BY REGION



Source: BP 2017, pg. 18.

FIGURE 2.6 OIL - MAJOR TRADE MOVEMENTS



Source: Bp (2017), pg 25.

The global production of oil is divided into the Organization of Petroleum Exporting Countries (OPEC)[13] members' production, and non-OPEC countries production. OPEC is the largest organization that is focused on oil production and it clearly has massive influence on global energy prices, its mission is "to coordinate and unify the petroleum policies of its member countries and ensure the stabilization of oil markets, in order to secure an efficient, economic and regular supply of petroleum to consumers, a steady income to producers, and a fair return on capital for those investing in the petroleum industry." (Sarhan, 2016). OPEC currently provides 43% of global oil production and has 73% of the world's "proven" oil reserves (Sarhan, 2016).
While the Opec producers are subjected to a central coordination and their oil production is concentrated mainly on national oil companies, the non-OPEC countries can make independent decisions regarding their production activities, which are mostly performed by international or investor-owned oil companies (EIA, 2018).

The main objective of international or investor-owned oil companies is to rise shareholder value and make investment decisions based on economic factors; also, they could add further goals that impact positively on their country in a wider sense, like rising employment or improve infrastructure (EIA, 2018). Consequently, non-OPEC producers' investment are able to react more readily

[13] OPEC is an international organization of 14 nations, founded in 1960. OPEC was founded in Baghdad and headquartered in Vienna since 1965. The 14 members are: Algeria, Angola, Ecuador, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, Venezuela. Source: Sarhan A. (Nov. 30, 2016)

to changes in market conditions and, moreover, since they respond to market prices rather than influencing prices by managing production, non-OPEC countries tend to produce at or near full capacity and so have little spare capacity (EIA, 2018).

Lower levels of non-OPEC supply cause upward pressure on prices: with the diminution of the total global supply, the result is a rise of the so-called "call on OPEC." (EIA, 2018). The “call on OPEC” term refers to the following dynamic: given that non-OPEC countries are assumed to produce as much as they can, guided essentially by price signals, whatever demand is left over can be served by OPEC (Perkins, 2016).
The greater the call on OPEC, the greater is its ability to influence prices.
Non-OPEC production prevail where relatively wide finding and high production costs occur, as most of the lower cost conventional oil resources are in OPEC member countries (EIA, 2018). Therefore, non-OPEC producers opened the way towards unconventional sources such as the deepwater offshore and oil sands and developed new technology (EIA, 2018). For this reason, non-OPEC producers often have a cost disadvantage compared to OPEC production, which has sometimes resulted in the development of higher-cost supplies, but then, as technology advances costs often fall, a downward pressure impact on prices (EIA, 2018).
Hence, on one side higher non-OPEC supply reduces oil prices, on the other, disruptions of non-OPEC production lowers global oil supply causing higher oil prices (EIA, 2018). The production’s variations adds to price volatility uncertainty (EIA, 2018).
The latest OPEC agreement, in an effort to stabilize declining oil prices, has been concluded on November 30, 2016. It has been decided that 11 of the then-active 13 members would reduce crude oil production by approximately 1.2 million barrels per day (bpd) for six months starting from January 1, 2017 (Brown P., 2016). On December 10, 2016, OPEC announced that 11 non-OPEC countries, led by Russia, had joined the agreement by pledging to further reduce oil production by 558,000 bpd. This "Declaration of Cooperation" to collectively reduce oil production by approximately 1.8 million bpd was extended for nine additional months until March 31, 2018 (Brown P., 2016) and later extended until June 2018.

The most important countries players in the oil industry are Saudi Arabia – OPEC member, the US, and the Russian Federation – both non-OPEC members.
Saudi Arabia ranks as the largest producers and exporter of petroleum. The kingdom possesses around 22% of the world’s proven petroleum reserves, which could allow the nation to pump out oil for decades with the same pace (Myers and Jareer, March 2007). The proven reserves reach the emphatic quantity of 267 billion barrels (Myers and Jareer, March 2007). World demand can be sufficiently supplied not only for the years to come but for at least the next 63 years (Myers and Jareer, March 2007). The oil and gas sector accounts

for about 50% of gross domestic product, and about 85% of export earnings[14]. The kingdom is heavily financed by oil and the crown jewel, Saudi Aramco, is the greatest economic actor. Saudi Aramco supplies 10% of world demand and manages 25% of the world's oil reserves (Myers and Jareer, March 2007). Therefore, Saudi Arabia has a strong interest to keep crude oil prices at high levels, even if this requires to decrease its own production (Perifanis and Dagoumas, 2017). This is exactly the production model of the OPEC, where the participating oil exporting countries agree on their production rates and Saudi Arabia, as the largest producer, is acting as the swing producer, namely, readjusts its production compared to the fluctuations of the production from other countries and the evolution of global crude oil demand (Perifanis and Dagoumas, 2017). However, it is not unusual that the participating countries in the OPEC deviate from their commitments, concerning their productions rates, due to internal problems of production or aiming at supporting their balances (Perifanis and Dagoumas, 2017). This practically affects the production share of Saudi Arabia and therefore its profitability. Moreover, external -to OPEC- factors, such as the evolution of shale oil and gas in the USA, strongly affect the market share of all OPEC countries, challenging their profitability (Perifanis and Dagoumas, 2017).

Since the US shale oil production started in the mid-2000s, it was clear that US shale resources might have at some point played an important role in non-OPEC supply prospects (Salameh, 2013). Shale and tight oil[15] are conventional oils (light oils with low sulfur content) trapped in unconventional formations whose low porosity and permeability makes it extremely difficult for producers to extract hydrocarbons (Maugeri, 2013). So far "drilling intensity" technologies have been the key factor that has made possible to recover more oil than previously expected from the huge but hostile shale/tight oil formations existing in the U.S, thereby supporting the boom of the country's shale oil production (Maugeri, 2013). An important characteristic of shale production is that it can be ramped up quickly relative to other types of oil field developments, this speed allows shale oil production to be 6 to 9 times more responsive to oil prices than production from conventional wells (Kellogg, 2018). Of course the impact is particularly substantial when it comes to the oil market because shale oil is a substitute of petroleum in consumption and a rival in production (Hongxun, 2018). In fact, the US shale boom lead the country to be the third oil producer today after Saudi Arabia and Russia (Hongxun, 2018). The shale revolution provides the United States with access to an energy supply that is stable, reliable, affordable which significantly enhances its energy security (Westphal K., 2014).

[14] See: OPEC (2017a)

[15] Shale oil must not be confused with oil shale. Oil shale is a precursor of oil called kerogen, a sort of teenage oil that constitutes the building blocks of conventional oil. For further information: Maugeri (2013).

While the United States is indeed exporting around 9% of U.S. crude oil consumption, it is still importing 348 millions tonnes (47% of U.S. crude consumption) (Kellogg, 2018). This makes the United States still a net importer of crude oil. Even accounting for U.S. net exports of petroleum products, the United States remains a net importer of crude oil and petroleum products overall (Kellogg, 2018). And it will continue to be so for at least the next several years, even under the most optimistic production forecasts (Kellogg, 2018).
However, U.S. shale oil's entrance onto the global stage benefits the United States far more than energy independence ever would (Kellogg, 2018). In fact, it may have forever shaken OPEC's ability to engineer oil prices (Kellogg, 2018). OPEC now knows that if it takes oil out of the market to try to jack up the oil price, U.S. shale producers will quickly step in (Kellogg, 2018). In this way, the U.S. shale oil boom promotes oil price stability, both in the United States and globally (Kellogg, 2018).

In a global context, the non-OPEC Russia has a 12.6% share of world oil and it is the second larger exporters - second only to Saudi Arabia (Henderson, 2015). As a result, shifts in its output can have a major impact on the global supply and demand balance and consequently the oil price (Henderson, 2015). Furthermore, the global reach of Russian oil exports, which are now traded through ports and pipelines in the Atlantic and Pacific basins, is a key foundation of the country's position as a global energy superpower, providing the Kremlin with significant geopolitical influence (Henderson, 2015). Russia exported 243 million tonnes of crude oil and condensate and more than 2.4 million b/d of petroleum products in 2016, mostly to countries in Europe (Barden, 2017). Exports of crude oil and petroleum products represented nearly 70% of total Russian petroleum liquids production in 2016 (Barden, 2017). Russia's oil and natural gas industry is a key component of Russia's economy, with revenues from oil and natural gas activities—including exports—making up 36% of Russia's federal budget revenues (Barden, 2017). Crude oil trade is important to both Russia and Europe: about 70% of Russia's crude oil exports in 2016 went to European countries, particularly Germany, Italy, Poland, and Belarus (Barden, 2017). Outside of Europe, China was the largest recipient of Russia's 2016 crude oil exports, receiving about 18% of Russia's total crude oil exports (Barden, 2017). Russia was the largest supplier of crude oil to China in 2016, surpassing Saudi Arabia for the first time on an annual basis (Barden, 2017). Russian crude oil exports to China have grown steadily since 2010, the mean of transport is the East Siberia-Pacific Ocean (ESPO) pipeline and pipeline connections through Kazakhstan (Barden, 2017). Russian ESPO-grade crude oil exported from Russia's Pacific port of Kozmino can reach Chinese ports quicker than crude oil shipped from the Middle East, allowing Russian crude oil to be shipped in smaller volumes and with more flexible scheduling (Barden, 2017).

Other important key centers of non-OPEC production include North America, regions of Central Asia former part of Soviet Union, and the North Sea.
The main growth in non-Opec supply, in addition to US shale, occurred in Canada - where the compaction of two large soil mines will increase production

by 0.5 mbd by 2020 (Statoil, 2017) -, Brazil, Russia - greater connections with Siberia allowed access to new fields (Statoil, 2017) - and Kazakhstan - thanks to the new Kashgan field's production started in 2016 (Statoil, 2017).

2.3.1 Puzzle of Strategies

The geopolitical balances have been affected over the time by the changing nature of the energy industry, whose last most important events have been the oil production increase in American shale fields, lower oil prices and the spread of natural gas use (Krauss, 2018a)
The fall in oil prices started in 2014 caused a loss of revenues in Saudi Arabia, which is seeking a solution to compensate it, whereas the US, China and the Russian Federation are hoping to gain a financial advantage (Krauss, 2018a).
The Russian Federation, after the Western sanctions and lower oil prices, is looking at Saudi Arabia for energy deals despite their rivalry in Syria, where the two countries support competing sides (Krauss, 2018a).
China is looking for a stable flow of Saudi investment in its growing petrochemical and refinery industries, and the US is interested in overlooking those moves in the hope that Saudi Arabia will continue to be a strategic supporter against Iran (Krauss, 2018a).
The situation is favorable to Saudi Arabia, since in its strategy aimed at diversifying the economy through new investment, there is the need to find new partners (Krauss, 2018a).
The core part of the project is the Saudi national oil company's, Saudi Aramco, initial public stock offering, which could lead to a deal of hundreds of billions of dollars (Krauss, 2018a).
The Saudi Aramco public offering fortune and the amount of the country's economic reforms is still uncertain, and important progress has not been completely reached so far, but, nevertheless, American, Chinese and Russian financiers are particularly interested in the initial public offering, which is scheduled to be presented later in 2018 (Krauss, 2018a).
Saudi Arabia has had a central role in global energy since at least World War II: when the kingdom created a global oil surplus to increase market share in the mid-1980s, it pushed the prices into a decline trend that played a part in causing the bankruptcy of the Soviet Union (Krauss, 2018a). Moreover, the Saudis were such a fundamental oil supplier to the US that the Americans went to war in the early 1990s also to protect the kingdom from the threat of an Iraqi invasion (Krauss, 2018a). In addition, when China needed new energy supplies for its expanding economy in the 2000s, Saudi Arabia set up an ambitious oil exploration program to meet the higher demand (Krauss; 2018a).
Despite these dynamics, it has became difficult for OPEC to manage oil prices alone.
American shale oil has enabled the United States to reduce imports of OPEC crude and to starts exports to markets once supplied by Saudi oil (Krauss, 2018a). The Saudis have been attempting to coordinate production's cuts in OPEC countries with cuts operated by Russia over the past two years, in order to maintain prices stability (Krauss, 2018a). In the frame of a longer-term period,

the Saudis aim to import natural gas to gradually replace domestic consumption of oil for electricity, and, in so doing, to free more crude for export (Krauss, 2018a). However, the kingdom is also investing considerably in refineries and petrochemical plants in Asia and US to seek granted markets for its oil (Krauss, 2018a).

The Russian Federation is certainly the most unexpected partner of Saudi Arabia since is supporting the opposite side of the Syrian conflict trying to strengthen relations with Iran (Krauss, 2018a). On the contrary, a stable partner is China, a country whose relation with Saudi grown close after Aramco bought a 25% stake in a refinery managed by the state-owned Sinopec, and after the two countries in 2017 signed a preliminary agreement to create an investment fund for infrastructure, energy and mining project worthing $20 billion. Agreements like that contribute to promote the Saudi Aramco ambition to be a global refining power station, that can do nothing but increase the value of the initial public offering of the company, which, however, is already one of the major oil producers in the world (Krauss, 2018a).
Regarding the United States, their shale fields presents favorable conditions that allow their production to better react in front of market prices fluctuation, and for this reason the States are expected to compete for the role of world's production leader (Krauss, 2018b).
Technological advances played a fundamental role by allowing the extraction of shale oil that led to a doubled output in a decade, converting unlikely places like North Dakota and New Mexico into global petroleum hubs (Krauss, Jan 28, 2018). In addition, a pipelines net is under construction in Texas, to serve ports where oil can be transported through the use of tankers in China, India and other markets (Krauss, 2018b).
However, concerns related to climate change and pollution, together with the growing popularity of electric cars and the worsening of the best shale fields will probably limit both production and demand in the next years. But nevertheless, in the short term, the shale boom has changed the landscape (Krauss, 2018b).

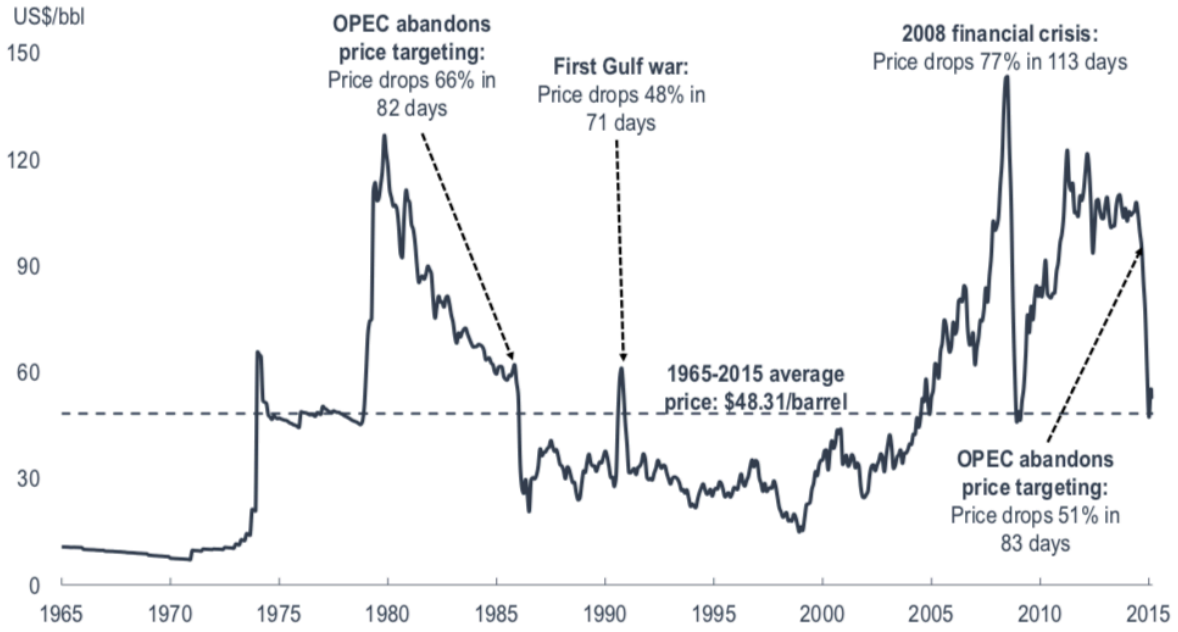
Now, Saudi Arabia is also trying to tie its future to another natural resource it has in abundance: sunlight (Reed, 2018).
The world's largest oil exporter is embarking on an ambitious effort to diversify its economy and reinvigorate growth, in part by plowing money into renewable energy (Reed, 2018). The Saudi government wants not just to reshape its energy mix at home but also to emerge as a global force in clean power (Reed, 2018). Saudi Arabia, with its vast oil resources, would seem an unlikely champion for renewables, but the country's location and climate mean it has plenty of promising sites for solar and wind farms (Reed, 2018). The costs of installing and operating those two technologies have fallen drastically around the world in recent years, that means that even in a country where oil is plentiful, renewables beckon as a cheap, and clean, alternative to traditional fossil fuels (Reed, 2018).

2.4 Commodities Prices Volatility

The aim of this chapter is to analyze the dynamics of the oil, coal and natural gas commodities prices swings. The analysis opens with the most important events in history of oil price volatility from early 90s to the present day. The choice to focus the analysis on this period is due to the fact that the country of Kazakhstan, the case study of this research, declared independence in 1991. Then the chapter proceeds with a comparative analysis regarding prices of the other commodities.

2.4.1 Oil Price Volatility

FIGURE 2.7 CRUDE OIL PRICES



Source: World Bank (2015a), pg. 7 .

The most shocking events in the term of impacts on oil prices from 1991 to 2017 have been: the Chinese growth in early 2000's, the financial crisis of 2008 and the OPEC price war. In the following paragraphs there will be a short analysis of each of these events.

• Chinese growth takes off in 2001

Since China joined the World Trade Organization in December 2001, Chinese exports of consumer goods and imports of primary commodities have grown dramatically, having major effects on the respective supplies and demands for commodities (Francis, 2007). China's industrialization policy has created a demand for commodities and industrial supplies to be used in the production of its exports and for construction and infrastructure investments (Francis, 2007).

Although China has a large resource sector, with over 10,000 mining enterprises employing five million people, in the period between 2000-2006, due to its economic growth, domestic output has been unable to keep up with domestic demand, this has created an import demand for commodities - especially primary commodities (Francis, 2007).
In the case of oil, between 2002 and 2004, China's oil consumption, driven by particularly rapid growth and a restructuring of its economy towards energy-intensive sectors, increased 28%, or by approximately 1.5 million barrels per day (BP, 2007). Consequently, China's share of world oil imports grew from approximately 3.5% in 2001 to over 6% of world oil trade in 2005. During the 2002–04 period, although China's import demand was growing strongly, the impact on the world oil price was moderate.
One reason was that the increase in China's demand at the time seems to have been perceived as temporary; hence, producers responded to what they thought was a short-term price rise by expanding production (Francis, 2007). For example, IMF underestimated China's growth and did not significantly raise its projection of China's medium-term growth, from 8 per cent to 9 per cent, until 2006[16] (Francis, 2007).
In response to these developments, global oil production rose, and spare capacity within the Organization of Oil Producing and Exporting Countries (OPEC) fell from an average of 3.7 million barrels per day between 1994 and 2002 to 1.5 million barrels per day between 2003 and 2005 (International Monetary Fund 2007). It was these production responses that helped to moderate price rises at the time (Francis, 2007). However, in 2006, at roughly the same time as the IMF began to make significant upward revisions to its outlook for China's growth, the EIA revised up its forecast for China's long-term oil consumption and then made another, more significant, upward revision in 2007, suggesting that the temporary increase in demand was now expected to be permanent (Francis, 2007). This change in expectations helps to explain why oil prices rose rapidly at this time (Francis, 2007).

• The 2008-09 crash

During the second half of 2008, oil prices declined more than 70 percent (World Bank, 2015a). The price collapse, which reflected uncertainly and a drastic reduction in demand – due to economic crisis, was not unique to oil (World Bank, 2015a). Most equity markets experienced similar declines, as did other commodity prices, including other energy (such as coal), metals, food commodities, and agricultural raw materials (World Bank, 2015a). The 2008 oil price crash was also accompanied by a spike in volatility as well as closer co-movement across most commodity prices (World Bank, 2015a).
In the run-up to the 2008 financial crisis, OPEC had reverted to restricting oil supplies in the early 2000s by briefly targeting a price range of $22-28/bbl (World Bank, 2015a). However, when prices exceeded that range in 2004, OPEC gradually raised its "preferred target" to $100-110/bbl (World Bank,

[16] For further information: International Monetary Fund (2007), 1-46.

2015a). As the financial crisis unfolded prices dropped to a low of less than $40/bbl (World Bank, 2015a). Within the next two years prices surged back to the $100 mark, helped by stronger demand as the global economy rebounded and supported by OPEC's decision to take 4 mb/d off the market (World Bank, 2015a).

• The 2014-2016 crash

Oil prices fell from a peak of $115 per barrel in June 2014 to under $35 at the end of February 2016, the recent price decline appears to be a mix of supply-driven decline and a collapse in demand (Rogoff, 2016).
Oil demand forecasts have been downgraded on several occasions as global growth repeatedly disappointed since 2012 (Baffes, 2015). This has reflected slowdowns in large emerging markets, since their economic activity tends to be more oil-intensive than that in developed countries (Baffes, 2015). In China, starting from 2010, slowing growth has led to sharp drops in commodity prices almost across the board, the drop in oil prices, has been significantly steeper than in metals and food (Rogoff, 2016). Moreover, economies like Russia, Brazil and India experienced similar patterns in the early 21st century.
Regrading the supply side, developments in global oil markets have taken place against a long-term trend of greater-than-anticipated supply, especially from unconventional sources of oil production in the United States, and, to a lesser degree, Canadian oil sands and the production of biofuels (Baffes, 2015). During the second half of 2014, the U.S. oil production outlook for 2014-15 was repeatedly revised upwards (Baffes, 2015). The rapid expansion of North American crude thanks to new technologies in shale oil extraction, horizontal drilling, and exploration in deep offshore (more than 2,000 m deep) has constituted a significant expansion of supply, while such traditional suppliers as Saudi Arabia have remained quite stable (Bchir, 2014). As a result of this local production, the two North American countries were able to cut their oil imports sharply, which put further downward pressure on world prices (Bchir, 2014). Indeed, it has been shown that three-fifths of the oil price drop in the second half of 2014 was caused by growth in supply, which would raise global economic activity between 0.3 and 0.7 percent in 2015 (Bchir, 2014).
As a result of rising unconventional oil production, OPEC's share of global oil supply has been steadily eroded (Baffes, 2015). To stem further losses of market share, several OPEC members began in the third quarter of 2014 to offer discounts to Asian oil importers, thus signaling OPEC's intentions to abandon price targeting. In its meeting in November 2014, OPEC "... decided to maintain the production level of 30 mb/d, as was agreed in December 2011"[17]. At the time, it opposed a move put forward by the smaller members to limit production to prevent a further slide in the price of oil. As a consequence, from the beginning of 2015, the total OPEC supply expanded by 2.7 million barrels per day (ECB, 2016). The bulk of this supply came from Iraq, Saudi Arabia and, later on, Iran but the production rates of some members declined because of

[17] See OPEC (2014)

low oil prices (ECB, 2016). This change in policy implied that OPEC will no longer act as the swing oil producer (Baffes, 2015).
In fact, later, at the Ministerial Conference on 30 November 2016 December 2016, OPEC and major non-OPEC oil producers reached their first deal to cut production since 2001: it set the terms for reintroducing an oil production target of 32.5 million barrels per day (ECB, 2016). The agreement involves a cut in output of 1.2 million barrels per day, to be implemented through a uniform 4.5% reduction of each member's supply, from January to June 2017. The 13 OPEC countries agreed to cut output by 1.2 million barrels per day (bpd), with Libya and Nigeria exempted. Eleven non-OPEC countries — Azerbaijan, Bahrain, Bolivia, Brunei, Equatorial Guinea, Kazakhstan, Malaysia, Mexico, Oman, Sudan, and South Sudan — made commitments to cut production by 1.8 million bpd among them. The deal has been extended of nine months, it was scheduled to expire in March 2018 originally, and it is expected to be revisited in June 2018 at the next official OPEC meting[18].
However, crude oil prices are projected to average $65/bbl in 2018 and 2019, supported by continued production restraint among OPEC and non-OPEC producers, but capped by slowing consumption growth and accelerating production growth from non-agreement countries, led by U.S. shale (World Bank, 2018). At its June meeting, OPEC is scheduled to consider extending or amending output limits in conjunction with non-OPEC producers (World Bank, 2018). Higher prices will benefit the U.S. shale industry and may result in faster output growth despite increasingly binding capacity constraints in the short-term (World Bank, 2018). The evolution of geopolitical tensions will also play an important role in determining oil prices (World Bank, 2018).
While a given oil price increase may be perceived positively by oil exporting countries and negatively by importers, an increase in oil price volatility (i.e. consecutive positive and negative oil price shocks) increases perceived price uncertainty for all countries – regardless of their trade balance.
Such oil price volatility reduces planning horizons, causes firms to postpone investments, and may require expensive reallocation of resources. Formulating robust national budgets becomes more difficult, as importing countries face uncertainty regarding import costs and fuel subsidies levels, and exporters face volatile revenues. This may be a particularly profound problem in budget constrained developing countries, which rely on oil exports as a main source of public revenue[19].

2.4.2 Natural Gas & Coal Prices Volatility

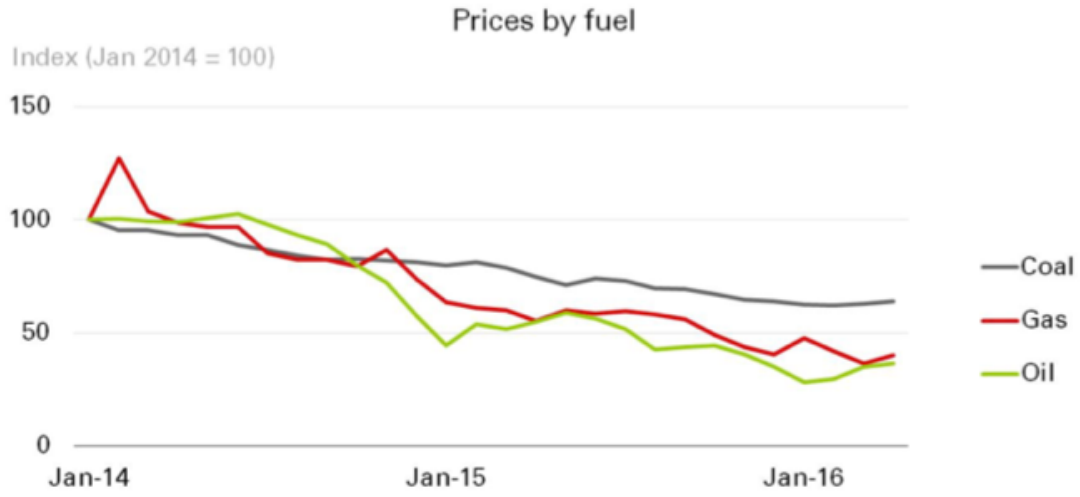
Differently from oil, for natural gas there is no single global price: there is a range of regionally determined prices, all with their own specificities, that become gradually more interconnected as the market become more linked, driven by the increasing share of liquefied natural gas (LNG) in global trade (IEA, 2017b). According to International Energy Agency (2017b pg 54-56), "the

[18] See OPEC (2017b) and Putz C., (2017).

[19] See Rentschler (2013)

price trajectory for North America is particularly important in the formation of global prices: the reference price is that of Henry Hub, a distribution hub in the US pipeline system in Louisiana where the price is set entirely by gas-to-gas competition, i.e. it is a price that balances regional supply and demand (including demand for gas for export)" (IEA, 2017b).
Both Ample supply in gas markets and a low level of oil prices caused a price decrease in all the major markets in 2016, even though gas prices varies by region (IEA, 2017b).

FIGURE 2.8 PRICES BY FUEL



Source: Finley Mark, 2016.

Most of the production growth for 2018 is expected in US shale gas production (mainly in the northeast Appalachian region) and associated gas from expanding shale oil production, mainly in Texas (IEA, 2017b). An increase in the resource estimate for shale gas in the United States, lower assumed costs for its production, and relatively flat consumption made EIA's 2018[20] Henry Hub price expectations to be lower than the 2017 average.
Prices in Europe and Japan are expected to increase by 15 and 9 percent in 2018, respectively, in part due to current higher oil prices which are indexed with a lag (World Bank, 2018).
Regarding Coal prices, after the volatility experimented from 2007 to 2011, they are now following a slowly increasing trend (World Bank, 2017a). Coal prices declined for the fourth consecutive year in early 2016, reaching the 50% less of the 2011 level (IEA, 2017b). The price fall was due to the overcapacity caused by the previous capacity expansion when prices were high, and it forced many coal companies around the world to close mines (IEA, 2017b).
Coal prices are expected to average $85/mt in 2018, down slightly from 2017, as inventories are replenished and consumption is curtailed (World Bank,

[20] See EIA, *Oil: Crude and Petroleum Products Explained* (2017)

2018). This is the reflection of the dynamics that are investing the coal market and the trends regarding natural gas (World Bank, 2018). In fact, coal consumption faces long-term structural declines in several consuming regions for both economic and policy reasons (World Bank, 2018). China, which accounts for more than half of global coal consumption, is expected to be a key driver of coal prices in the sea-borne market, as it reforms its energy sector away from coal toward cleaner burning fuels (World Bank, 2018).
The measures ordered by the Chinese National Development and Reform Commission (NDRC) to reduce production and their consequences spilled over into global coal markets, with world prices taking their cue from China (World Bank, 2017a). Coal demand faces environmental headwinds going forward, and China's coal policy will be a key driver given that the country consumes half of the world's coal output and that coal accounts for more than 60 percent of the country's energy needs (World Bank, 2017a). In the United States, low-priced natural gas has reduced coal usage in power generation, and led to a reduction in investment in coal supply (World Bank, 2018). Meanwhile, several European countries plan to end coal consumption over the next decade, and India is seeking to reach peak coal consumption over the same period (World Bank, 2018). In the long term, different conditions could put modest upward pressure on coal prices (IEA, 2017b). Among these conditions there are: worse geological situations, lower coal quality in mature mining areas, longer transport distances in new mining regions, increasing mining costs (due to an upward trend of fuels and explosives prices) (IEA, 2017b).

2.5 Renewables

The definition of renewable energy sources given by the International Energy Agency includes energy generated from solar, wind, biomass, the renewable fraction of municipal waste, geothermal sources, hydropower, ocean, tidal and wave resources, and biofuels (IEA, 2007). Renewable energy sources play a central role in moving the world onto a more secure and sustainable energy path. The potential is unquestionably large, but how much and how quickly their contribution to meeting the world's energy needs grows hinges critically on the strength of government policies to stimulate technological advances and make renewables cost competitive (OECD, 2011).

The race for clean energy technology implementation by the world's nations is taking shape. Renewables are generally more capital intensive than fossil fuels, so the investment needed to provide the renewables capacity is very large (BNEF, 2011). Non-economic barriers have significantly hampered the effectiveness of renewable support policies and driven up costs in many countries, irrespective of the type of incentive measure. Examples include administrative hurdles in land-use planning and siting, long lead times for permits, lack of coordination between relevant authorities; grid access; lack of technical capacity and training and social acceptance (IEA, 2008). The global leaders of renewable energy are European Union, US and China.For more than two decades, the European Union (EU) has been at the forefront of global

renewable energy deployment. The adoption of long-term targets and supporting policy measures has resulted in strong growth in renewable energy consumption across the region, from a 9% share in 2005 to 16.7% in 2015 (IRENA, 2018). Key renewable technologies such as solar PV and offshore wind have achieved spectacular cost reductions, exceeding expectations both in terms of their speed and extent (IRENA, 2018). As these technologies improve, so does the renewable potential that can be harvested cost-effectively.

TABLE 2.8 RENEWABLE ENERGY WORLD CONSUMPTION (2016)*

Top 3 Consumers	Consumption (in million tonnes)	Share of world production %
Solar Energy		
European Union	25.2	33,5%
China	15.0	19,9%
US	12.8	17,1%
Total world	75.4	100%
Wind Energy		
European Union	68.0	31,3%
China	54.5	25,1%
US	51.8	23,8%
Total world	217.1	100%
Geothermical, biomass and other renewable energy sources		
European Union	42.4	33,4%
US	19.1	15,1%
China	16.6	13,1%
Total world	127.1	100%

**Notes. Based on gross generation and not accounting for cross-border electricity supply. Converted on the basis of thermal equivalence assuming 38% conversion efficiency in a modern thermal power station.*
Data Source: BP, 2017.

To fulfill its aspiration to become the global leader in renewables, Europe will need to maintain a growing domestic market (IRENA, 2018). The additional investments required to reach a 34% share by 2030 would help Europe maintain its leading role while deriving substantial macroeconomic benefits in terms of growth and balance of trade, as well as creating a new industrial base around the renewables sector (IRENA, 2018). Accelerating the deployment of renewables would have much broader social benefits for the EU and its Member States. It can boost economic activity and create new jobs. Moreover, the decentralised nature of many renewable energy technologies and the

increased uptake of domestic biomass production could be a driver for economic development among structurally weak regions and rural areas (IRENA, 2018). Combined with energy efficiency measures, renewables can also be a key contributor to reducing energy poverty in the EU (IRENA, 2018). Finally, realizing renewable energy potential would bring the EU closer to a decarbonisation pathway compatible with the "well-below" 2°C objective established in the Paris Agreement, while substantially improving the health of citizens (IRENA, 2018).

Investment needs are greatest in China, which has now emerged as a leader in wind power and photovoltaic production, as well as a major supplier of the equipment (BNEF, 2011). The extent of China's domestic investment in renewables has surpassed all expectations, with the resulting technology development and economies of scale driving down costs to the point where renewables are exceeding grid parity in an increasing number of market segments (Buckley T., Nicholas S., 2017). In renewables, China is now actively pursuing a "Going Global" strategy, particularly in conjunction with its "One Belt, One Road" program, which aims for a Pan-Asia development approach (Buckley T., Nicholas S., 2017).

The United States (US) has the potential to lead the global transition to renewable energy. It has some of the best wind, solar, geothermal, hydro, and biomass resources in the world (IRENA, 2015). It also has a vibrant culture of innovation, plentiful financing opportunities, and a highly skilled workforce, alongside an agile and entrepreneurial business sector (IRENA, 2015). With the right policies and support, using technologies available today, the share of renewables in the US energy mix (total final energy consumption) could more than triple by 2030, from 7.5% in 2010 to 27% (IRENA, 2015). However, despite the expansion of US in the oil sector is more likely going to shape the future of US energy pattern, the US needs to adopt systems that better account for the external costs of using fossil fuels, including human healthcare costs, local environmental damages, and the effect of greenhouse gas emissions and climate change on the US macroeconomy (IRENA, 2015).

Beyond these three countries, increasingly, governments around the world, including in emerging markets have started focusing on renewable energy as an important part of the energy portfolio. This is driven not only by energy security and diversification considerations, but also based on environmental considerations, global commitments, renewable technology development and strong sector appetite for green projects. The key risks pertaining to the renewable energy projects have been addressed very effectively in many jurisdictions: Market risk (tariff, off-taker, currency/exchange rate etc.); Operational risk (engineering, procurement and construction and operation and maintenance); Reliability of resource (availability of a reliable data and validating tools for confirming secure resource); Infrastructure readiness (grid infrastructure development, maintenance and evacuation has been strengthened to address any intermittency issues); Policy support (national and sub-national/regional targets, open/transparent tendering mechanisms); Technology improvement (innovations and upgrades with better efficiency, operational flexibilities and lower costs). According to KPMG (2016) report

Global Trends in Renewable Energy, the next decade will see further growth and penetration of renewable energy in various countries (KPMG, 2016). Clean and green power seems to be no longer just an idealistic aspiration but an economically compelling and sustainable proposition, making it a critical part of the energy portfolio of most utilities (KPMG, 2016).

CHAPTER 3 – CASE STUDY: KAZAKHSTAN AND THE TERMS OF TRADE

This chapter aims to introduce the country of Kazakhstan, its economic situation and an analysis of its terms of trade, as case study of this thesis. The chapter is divided into three parts according to the different topics: in the first part there is a brief description of the historical background, political and social situation; the second part focuses on the economy and the development of the main industrial companies across the country, the third one is dedicated to the analysis on the terms of trade.

3.1 The Country of Kazakhstan

The country of Kazakhstan is located in Central Asia, it borders with Russia to the North, with China to the East, with Kyrgyzstan Turkmenistan and Uzbekistan to the South and with Russia and the Caspian Sea to the West. Located in the middle between Russia and China, hinge between East and West, Kazakhstan boasts a strategically geographical and geopolitical position that played a vital role in the development of the country since the beginning of its history. In fact, Kazakhstan is located as a crossroads of civilizations and trade routes. Various tribes and states emerged and contributed to build the land and the society that is today's Kazakhstan.

FIGURE 3.1 KAZAKHSTAN MAP

Source: United Nations Department of Pacekeeping Operations, January 2004.

3.1.1 A Background History

Going back to the 1st-8th centuries, the lands of Kazakhstan have been invaded by Turkic-speaking and Mongol tribes. The Mongol tribes led by Gengis Khan invaded Central Asia in the middle ages and during the following centuries they merged with the Turkish tribes, becoming the majority in those lands (BCC, 2012). The Russian influence, which plays a huge role in defining the Kazakh history, started in the 17th century when the leaders (Khans) of three tribal unions (Zhuzes) formally joined Russia with the aim to protect their lands from the invasions by Eastern Mongols tribes (BCC, 2012). A century later Tsarist Russia took control over the tribes, deposing the Khans and introducing

TABLE 3.1 GENERAL DATA OF KAZAKHSTAN (2016)

Surface Area (sq Km)	Total Population Milliions	Pop. Density kmsq	Capital City	Currency	Exchange Rate (/US$)
2,724,902	17.988	6.6 people	Astana	Tenge	342.160

Source: UNCTADStat (2018)

thousands of Russian and Ukrainian people in Kazakh lands. Then, during the Soviet rule, Kazakhstan became a republic of the USSR (BCC, 2012). A period of intensive industrialization and collectivization of agriculture begun and, aresult of the campaign to settle nomadic Kazakhs and collectivize agriculture, more than 1 million people die from starvation (BCC, 2012). At the same time, hundreds of thousands of Koreans, Crimean Tatars, Germans and others forcibly moved to Kazakhstan (BCC, 2012). During the USSR period, important facilities have been built in Kazakh land: the most important is the Russian Cosmodrome of Baikonur, the world oldest space-launching facility, built in the middle of the steppes near the Aral Sea. In 1957, Sputnik 1, the first satellite to orbit the Earth, was launched from there, and four years later Yuri Gagarin became the first man in space (BCC, 2012). One of the latest mission happen on the 28th of July in 2017 when the Italian ESA astronaut Paolo Nespoli, NASA astronaut Randy Bresnik and Roscosmos commander Sergei Ryazansky were launched into space from the Baikonur cosmodrome in Kazakhstan at 15:41 GMT (17:41 CEST), the mission successfully ended on 14th December 2017 when the astronauts touched down on the Kazakh steppes at 08:37 GMT (ESA, 2017).

Anti-Soviet movements started in 1986 when 3,000 people took part in protests in Almaty after Soviet leader Mikhail Gorbachev appoints Gennadiy Kolbin, an ethnic Russian, head of the Communist Party of Kazakhstan (CPK), replacing Dinmukhamed Kunayev, an ethnic Kazakh (BCC, 2012). Three years later Nursultan Nazarbayev, an ethnic Kazakh, became head of the CPK; the parliament adopted a new law on language, proclaiming Kazakh the state language and Russian a language of inter-ethnic communication (BCC, 2012). The independence was reached in December 1991 when the USSR definitely collapsed and Nursultan Nazarbayev won uncontested presidential elections;

Kazakhstan declared independence from the Soviet Union and joined the Commonwealth of Independent States (CIS) (BCC, 2012). The city of Almaty located in south east Kazakhstan, as established under the Soviet Union, became the capital, but in 1997 the president moved the capital in Akmola, later re-named Astana – which in Kazakh language means “capital city” - in the central-north part (Arslan, 2013).

The action of changing the capital city has a historical significance and uniting power (Arslan, 2013), especially within the framework of the history of this country. The justifications provided by the government regarded both domestic and political reasons. On the one hand the high probability of earthquakes in Almaty and its pollution level incentivized the move of the capital from there toward other areas; on the other hand, for a nation that aims to prosper as a new centre for Eurasian economy and development, the need of a more central capital city played its role (Kopbayeva, 2013). In fact, the concept of ‘Eurasianism’ - that is the idea of playing a unique role between European and Asian cultures - promoted by government as a keystone of the new national identity, is one of the most important reasons behind the capital’s move (Kopbayeva, 2013). According to the government, Almaty was not able to express Kazakhstan’s mission to be a “bridge” between Europe and Asia because of its location in the south-est of the country, on the contrary, as Kazakhstan was uniquely situated at the crossroads of cultures, also the capital should have enjoyed a singular location in the heart of the Kazakh steppe providing a more effective transportation, communication, and defense (Clapham, 1999).
Moreover, also the probability of inter-ethnic tensions in the North has been a significant and relevant factor impacting on the capital’s move decision (Kopbayeva, 2013). This is due to the presence of a large number of minorities and different ethnics, especially from the Soviet period, when the majority of the population was Russian, and many Ukrainian, Belorussian, German, and Tatar have been forced to move in the steppes (Kopbayeva, 2013). All these different populations mixed up with an already differentiated population substrate made of Kazakhs, Uzbeks, Uighurs and Koreans (Kopbayeva, 2013).
After the Soviet period, the majority of Kazakhs were located in the southern regions, while the north was characterized by a large concentration of Russians, that increased the threat of separatism (Kopbayeva, 2013). From Astana the government can better control problematic Northern regions by keeping them under constant surveillance, which was difficult to realize from Almaty, located 700 miles away from the North. Moreover, the capital’s move is also an effort to balance ethnic diversity with the distribution of Kazakhs to the North, and a symbolic reclamation of the Kazakh territorial integrity and sovereignty (Melvin, 1995).
Moreover, the President’s effort to demonstrate the country’s readiness for socio-economic transformations is reflected also in the new capital’s cityscape: the particular innovative architecture of Astana symbolizes both the willingness of an independent nationhood and the state’s openness to new international affairs (Kopbayeva, 2013). Moreover, the capital’s move in the middle of the

TABLE 3.2 ETHNIC COMPOSITION IN KAZAKHSTAN, CENSUS DATA 1959-1999 (%)

Nationality	1959	1970	1979	1989	1999
Kazakh	30.0	32.6	36.0	40.1	53.4
Russian	42.7	42.4	40.8	37.4	29.9
Ukrainian	8.2	7.2	6.1	5.4	3.7
Belorussian	1.2	1.5	1.2	1.1	0.8
German	7.1	6.6	6.1	5.8	2.4
Tatar	2.1	2.2	2.1	2.0	1.7
Uzbek	1.5	1.7	1.8	2.0	2.5
Uighur	0.6	0.9	1.0	1.1	1.4
Korean	0.8	0.6	0.6	0.6	0.7

Data Source: Dave Bhavna (2003) pg 5.

steppes can be considered as a reclamation of the nomadic past of the Kazakh native population before the domination of the Soviet Union, and in so doing Astana creates a symbolic link between the past of the natives and the present independent period, skipping the Russian colonization (Kopbayeva, 2013).
The city, with its colossal project, is the world's first capital built in the twenty-first century (Kopbayeva, 2013). By 'advertizing' Astana to the world, Kazakhstan realized contracts with the world's biggest architectures and building companies like: Kisho Kurokawa, Norman Foster, Studio Nicoletti Associati, Adrian Smith and Gordon Gill (Kopbayeva, 2013).

3.1.2 Population

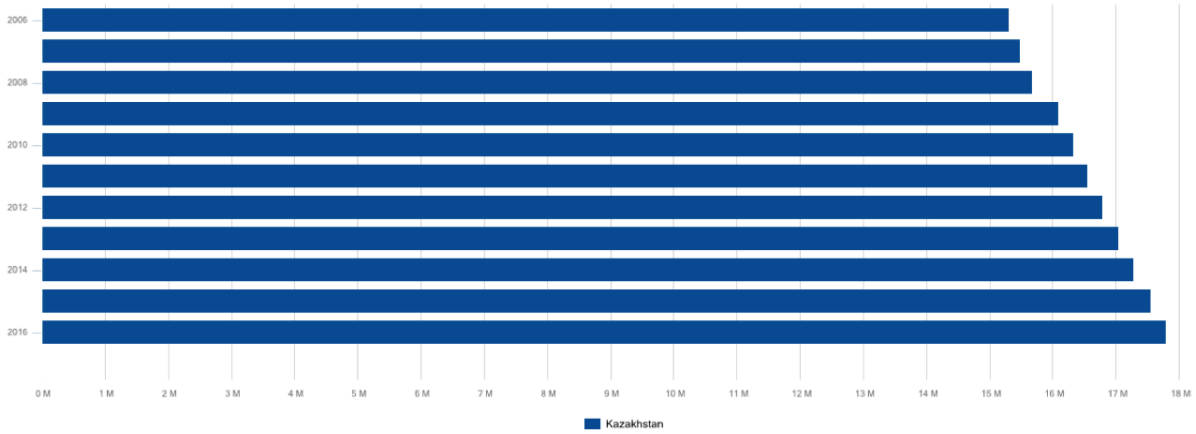
According to the World Bank (World Development Indicators, 2016) for 2016 the total population in Kazakhstan is of 17,794 millions and it counts around 130 different ethnics across the country - Kazakhs, Russian, Uzbeks, Ukrainians, Uighurs, Tatars, German, Belarusians, Koreans, Polish, Ingushetian, Azerbaijanis, Kyrgyz, Chechen, Armenians, Bashkir, Moldavians and other minorities (JSC, 2014). The population is keeping an increasing trend since the last 10 years:

TABLE 3.3 POPULATION DENSITY (PEOPLE PER SQ. KM OF LAND AREA)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Kazakhstan	5.7	5.7	5.8	6.0	6.0	6.1	6.2	6.3	6.4	6.5	6.6

Source: Author's elaboration on World Development Indicators Databank tool (2018).

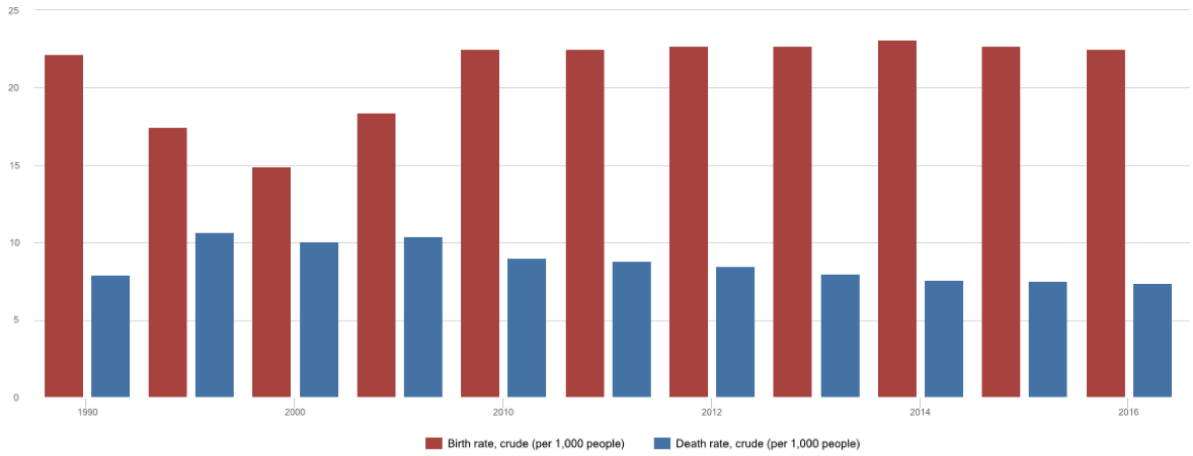
FIGURE 3.2 TOTAL POPULATION OF KAZAKHSTAN FROM 2006 TO 2016



Source: Author's elaboration on World Development Indicators Databank tool (2018).

What is particularly curios, is the population density, which is very low due to the wide size of the country and to the steppes places which are in some cases completely inhabited. Number of births has been higher than the number of deaths since 1950, confirming that the country is on a path of increasing its population.

FIGURE 3.3 BIRTH AND DEATH RATE IN KAZAKHSTAN FROM 1990 TO 2016*



**Birth rate is expressed in red columns and death rate in blue ones, both the rates are expressed per 1000 people.*
Source: Author's elaboration on World Development Indicators Databank tool (2018).

Finally, most of Kazakhstan's population practice Islam: 70.2% are Muslims, about a quarter of the population is Christian (26.3%), 3.5% follows a different religion or any religion (JSC, 2014).

3.1.3 Political Outlook

The President of Kazakhstan is Nursultan Nazarbayev, who has been in power since before the collapse of the Soviet Union, and his party, the Nur Otan (Radiant-Fatherland), dominates the parliament (EIU, 2017). According to the analysis of the Economist Intelligence Unit (2017, pg 3): “the economic and political power is shared and contested by elite networks based on economic and bureaucratic alliances, overlaid in some cases by historical or imagined clan allegiances. Parliament at present provides little check on the presidential administration and the government, but it does offer limited scope for revision to legislative initiatives in response to lobbying and public opinion”.
Despite institutions are weak, the political system is characterized by a broad stability (EIU, 2017). In fact, Mr. Nazarbayev enjoys high long-lasting levels of public support, and his administration increased significantly the population’s living standards over the past decade (EIU, 2017). However, high levels of inequality persist all over the country, and a weak economic performance in the coming five years could result into a rise in public dissatisfaction (EIU, 2017).
The main event that could cause a political instability is the departure of the President Nazarbayev - who will turn 78 in July 2018 - from the political scene, in fact, in order to avoid future instabilities, on January 25th 2017 he announced constitutional reforms aimed at gradually devolving powers from the presidency to parliament and the government (EIU, 2017). The reforms’ plan is an important sign since it suggest that a sort of preparation for a political transition is under way (EIU, 2017). Even if the actual party system is not competitive, and the genuine opposition has been marginalized, the redistribution of powers after Mr Nazarbayev’s future departure could strengthen the parliament oversight over government and the legislative process (EIU, 2017). The way in which the transition of power will take place remains still highly uncertain: the Kazakh system has, in a certain way, prevented the development of an institutional structure able to assure a clear source of legitimacy for the President’s successor, who has not been identified yet (EIU, 2017)
However, according to the Economist Intelligent Unit’s (2017, pg 3) estimations, even under the constitutional reform’s scenario, the “political decision-making is likely to remain non-transparent, highly informal and authoritarian”, and the most probable scenario remains that Nazarbayev will remain in the political scene until at least 2020 (EIU, 2017).
Regarding the probability of terroristic episodes in the country, it is important to underline that during the 2017 the government decided to delete its terrorism threat warning, which has been stationary at the “moderate” level since June 2016 (EIU, 2017)
The probability of an actual major terrorist attack is relatively low, but, according to the Economist Intelligent Unit’s (2017, pg 3): “the limited and sometimes conflicting information released by the security services makes this difficult to assess” (EIU, 2017).

- International Relations

Kazakhstan has been relatively successful in pursuing a multi-vector foreign policy, by avoiding excessive dependence on any single country or bloc with the diversification of trade and investment (EIU, 2017). Thanks to this strategy, the country is retaining good relations with the West, China, Russia and the Islamic world (EIU, 2017).
However, bounded by the past, Russia will continue to be Kazakhstan's main diplomatic and security partner, and despite the Kazakh leadership will seek to maintain strong ties under almost all circumstances, the Russian cultural, economic and political influence over the country could gradually decrease (EIU, 2017).
Kazakhstan is a member of the Eurasian Economic Union (EAEU), which counts also Armenia, Belarus, the Kyrgyz Republic and Russia as its members. The EAEU was officially launched on January 1st 2015, and it is aimed to create a common market and regulatory regime (EAEU, 2018), even if, in practice, institutional harmonization will be limited since the interaction of national and supranational regulatory bodies could create regulatory uncertainties to the business operating environment (EIU, 2017).
In fact, trade policy has already become in certain way less harmonized, due to Russia's embargo on Western and Ukrainian products, this is why the Economist Intelligent Unit (2017) expects that any successor to Mr. Nazarbayev will probably be less instinctively integrationist than the current president (EIU, 2017). However, Kazakhstan is highly unlikely to leave the EEU formally, even if regulatory harmonization could, in effect, be allowed to lapse (EIU, 2017).
Kazakhstan is also a member of the Shangai Cooperation Organization (SCO), originated with the purpose of developing a free-trade zone between its members, which are also: India, Pakistan, China, Russia, the Kyrgyz Republic, Tajikistan and Uzbekistan (EIU, 2017). The SCO had a head of states summit in Astana, Kazakhstan on June 8th-9th 2017, which was indicative of Kazakhstan's consistent pursuit of a multi-vector foreign policy (EIU, 2017). In fact, President Nazarbayev used the reunion to highlight Kazakhstan's diplomatic achievements and its plans to become a regional transit hub, by participating at the China's Belt and Road Initiative to boost regional connectivity and infrastructure (EIU, 2017).
The summit ended with the signing of a joint declaration, a convention against extremism and a declaration about counteracting international terrorism (SCO, 2018).

•Kazakhstan's Accession in WTO

Kazakhstan officially acceded to the WTO on 30 November 2015[21]. The main purpose of the Law on WTO Accession is to make national legislation compliant with international treaties executed by Kazakhstan in the frameworks of the WTO, many developing countries that have acceded to the WTO undertook significant structural reforms during the accession process. WTO accession can be used as an important mechanism to intensify and accelerate domestic

[21] See: infomercatiesteri.it (2018)

structural reforms beyond simple trade liberalization, helping the country in moving to a more open and market oriented model of economic development (WTO, 2015). It signals a readiness for reforms and commitment to globalization. It enables countries to adhere to multilateral rules, thus raising confidence among investors (WTO, 2015).

3.2 Economic Outlook

This paragraph is aiming at describing the economy of Kazakhstan, its dynamics and its problems, with a special focus on the oil sector, which is particularly relevant for the purpose of this thesis.

In fact, Kazakhstan boasts a huge oil and natural gas reserves, rich unmined veins of copper, chrome and aluminum, and substantial gold deposits, as well as enough developed farm and pasture land to feed itself, yet these resources were poorly utilized during the first decade after the country became independent in late 1991 (Pomfret, 2005). In the initial years following independence, the country's leadership was concerned with nation building in the context of real prospects of secession or internal
ethnic conflicts (Pomfret, 2005). Then in the mid-1990s Kazakhstan's privatization process started and between September 1995 and the end of 1996 many of the most valuable state enterprises were sold, during this period the government's attention also began to focus more narrowly on oil sector development, and became associated with wealth accumulation by the elite (Pomfret, 2005). The economy entered in a boom period in the early twenty first century, and was hit by several negative exogenous shocks in notably due to global financial crisis, low oil prices and slow growth in its major trade partners (Pomfret, 2005). The following session will show an analysis of the main events that affected the GDP growth of the country of Kazakhstan.

3.2.1 GDP

Kazakhstan registered one of the most dynamic growth rate of the world since its independence has been declared in 1991. The rate reached its highest point in 2000s and its lowers in 2009 and 2016 (tables 3.4 and 3.5).

TABLE 3.4 GDP PER CAPITA GROWTH IN CURRENT US$

2000	2008	2009	2010	2011	2012	2013	2014	2015	2016
1,229.0	8,513.6	7,165.3	9,070.6	11,634.4	12,387.2	13,890.9	12,806.6	10,510.0	7,714.7

Source: Author's elaboration with World Development Indicators Databank tool (2018)

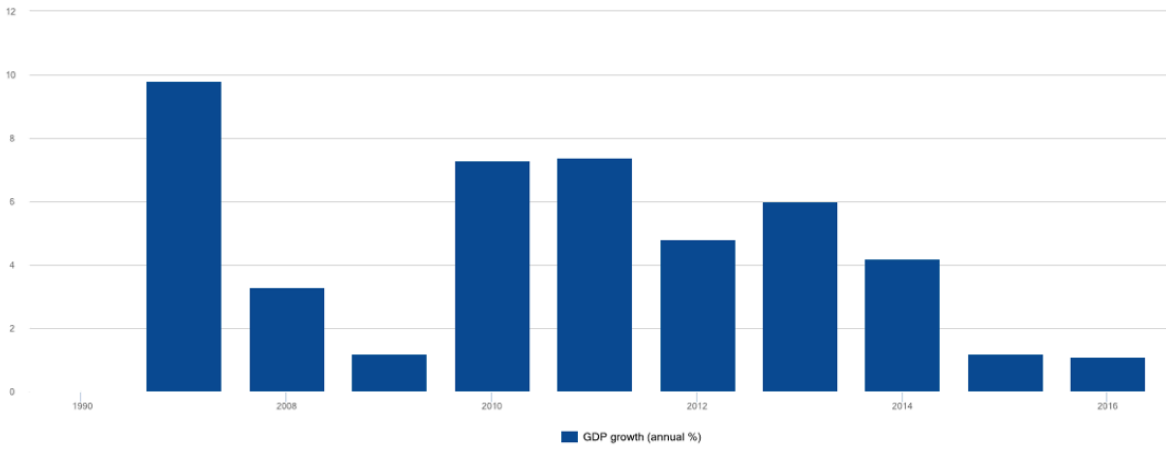
TABLE 3.5 GDP GROWTH IN KAZAKHSTAN (%)

	2000	2008	2009	2010	2011	2012	2013	2014	2015	2016
GDP growth (annual %)	9.8	3.3	1.2	7.3	7.4	4.8	6.0	4.2	1.2	1.1

Source: Author's elaboration with World Development Indicators Databank tool, created on 10th May 2018.

In 2008, the global financial crisis has significantly slowed down the world economic growth; there was a recession in a number of countries, including Kazakhstan (National Bank of Kazakhstan, 2009). Then in 2014-2015, a new pattern of decline in GDP growth dynamics happened for different reasons leading to one of the lowest level of GDP in 2016. In the second half of 2014, oil prices faced a substantial drop and then they remained low in 2015, averaging about US$53 per barrel during January-October 2015, with negative implications for both Kazakh domestic consumption and investor confidence (World Bank, 2015b). Meanwhile, the main commercial partners of Kazakhstan slowed their growth.

FIGURE 3.4 GDP GROWTH 2000-2016



Source: Author's elaboration on World Development Indicators Databank tool (2018).

In the second half of 2014 oil prices faced a substantial drop, then they remained low in 2015, averaging about US$53 per barrel during January-October 2015, with negative implications for both Kazakh domestic consumption and investor confidence (World Bank, 2015b). Meanwhile, the main commercial partners of Kazakhstan slowed their growth. China's GDP growth rate has been estimated to slow down to less than 7%, and Russia's economic growth contracted by 3.5% in 2015, affecting demand for Kazakhstan's exports and, thus, translating into lower economic growth and

inflation for Kazakhstan (World Bank, 2015b). Kazakhstan's GDP growth slowed from 4.2% percent during 2014 to 1.2% percent in 2015. Oil prices dropped by more than 50 percent between June 2014 and October 2015, cutting export revenues by almost a half and creating a twin deficit in the fiscal and current-account balances in 2015 (World Bank, 2015b). In addition, foreign direct investment (FDI) inflows declined and the overall external balance deteriorated, putting downward pressure on the tenge, the national currency (World Bank, 2015b).

TABLE 3.6 GDP GROWTH IN CHINA AND RUSSIA, EXPRESSED IN %.

	2000	2008	2009	2010	2011	2012	2013	2014	2015	2016
GDP growth (annual %) China	8.5	9.7	9.4	10.6	9.5	7.9	7.8	7.3	6.9	6.7
GDP growth (annual %) Russia	10.0	5.2	-7.8	4.5	5.3	3.7	1.8	0.7	-2.8	-0.2

Source: Author's elaboration with World Development Indicators Databank tool, created on 10th May 2018.

The 2014-2016 crisis highlighted the fragility of the economic system in Kazakhstan, too much dependent on both oil industry, and consequently on oil volatility, and trades with Russia and China. In March 2015, the authorities adopted a proactive fiscal policy stance by adjusting on-budget spending to reflect the expectation of lower prices of oil over a longer period (World Bank, 2016). The authorities also balanced earlier spending commitments under the "Nurly Zhol" infrastructure development program with reductions or delays in other non-priority capital expenditures, but off-budget support to the national oil company increased the non-oil deficit, offsetting the consolidation efforts (World Bank, 2016). Moreover, in May 2015, the government has highlighted the importance of institutional and structural reforms to diversify the economy from oil industry's related activities, launching the reform program "One Hundred Concrete Steps, a Modern State for All", which includes reforms in public administration, public financial management and accountability, the management of state-owned enterprises (SOEs), and various sector-specific reforms, directed to support governance and reduce the role of the state in the economy (World Bank, 2016). Since the rapid implementation of planned reforms would have an important effect on the drivers of medium-term growth, then in December 2015 the basis of legislation for this reforms, along with the introduction of a privatization programme, was passed (World Bank, 2016). According to the World Bank (2016) the higher growth of the non-oil economy, and its better quality, will help in the creation of more productive jobs for the large group of people that will enter the labor market starting in 2020 (World Bank, 2016).

In 2016, sine the decline in global oil prices was impacting negatively on the suffering economy, resulting in a real GDP growth rate of 1.1%, the authorities

decide reschedule later in time a planned fiscal consolidation and extended economic support measures, financed by the oil fund and additional borrowing (World Bank, 2017c). The economic support measures consist on a program focused on a) fostering domestic demand by higher public wages and social transfers, b) extended provision of subsidies to state-owned enterprises (SOEs) and small and medium-sized enterprises (SMEs), and c) support to the banking sector (World Bank, 2017c).
The GDP growth accelerated in the first nine months of 2017, peaking up to 4.3% (compared to the 0.4% level in the same period of 2016), and the general growth increased after a recovery in the oil sector which impacted positively even in the other economic sectors. (World Bank, 2017c). The economy expanded also thanks to the better performances of the manufacturing, agriculture, transport, and trade sectors, helped by higher domestic demand (World Bank, 2017c).
Going forward, if the implementation of structural reforms is successful, it will assist in the diversification of the economy and would increase Kazakhstan's growth potential and ambitions (World Bank, 2017c). The scope of the ongoing structural and institutional reforms should be to diminish the role of the state in the economy, in order to promote the development of a innovative and dynamic non-oil sectors (World Bank, 2017c). In the reforms' context, state-owned enterprises (SOEs) need to be restructured and gradually privatized, and at the same time public administration need to increase its efficiency (World Bank, 2017c). Moreover, a prudent fiscal and monetary policies would support economic and price stability (World Bank, 2017c).
Finally, the initiative "One Belt One Road" promoted by the Chinese President Xi Jinping in 2013, aimed to create a better infrastructural connection between Europe and Far East in order to boost trade following the pattern of the ancient Silk Road, could open further business possibilities for Kazakhstan, placed in a strategic position[22].

In order to build a more complete overlook regarding the growth of the country, It is interesting to compare the GDP per capita trend and some important social indicators like the inequality rate and the unemployment rate.

TABLE 3.7 SOCIAL INDICATORS AND GDP PER CAPITA

Social Indicators (Percent)	2009	2012	2013	2014	2015	2016
Inequality – Gini coefficient	28.2	28.1	27.1	27.8	27.8	27.8
Official unemployment rate	6.6	5.3	5.2	5.0	5.1	5.0
GDP per capita (current US$)	7,165.3	12,387.2	13,890.9	12,806.6	10,510.0	7,714.7

Source: Author's elaboration with World Development Indicators Databank tool (2018)

[22] For further information see the Official Belt and Road Portal (2017).

During the years from 2012 to 2016, unemployment rate shows a little improve in 2014 and 2016, before and after the oil price shocks that happened in 2014-2015, apart from that, the indicator remains substantially flat. However, there have been an improvement from 2009 when the country faced the international financial crisis and the unemployment rate was at 6.6.
At the same time GDP per capita pictures a country that faced a relevant growth from 2009 to 2014, when the decline started, resulting in a GDP per capita level that in 2016 is lower than the international crisis level of 2009.

By a large margin, income from wage employment has been the primary driver of poverty reduction (World Bank, 2018). This has led to a pattern of growth-driven welfare improvements, fueled by low unemployment rates and rising real wages (World Bank, 2018). However, economic growth decelerated in 2015 following a large decline in oil prices, leading to an increase in the poverty rate (World Bank, 2018). Real wages fell, the unemployment rate has remained relatively flat throughout the downturn (World Bank, 2018). Targeted social assistance has been responsible for little poverty reduction over the past decade, and was insufficient to prevent increasing poverty incidence in 2015 (World Bank, 2018). Poverty rates remain substantially higher and average wages lower in rural areas, but the high cost-of-living in urban areas retrains internal rural-to-urban migration (World Bank, 2018).

3.2.2 The Oil Industry

Oil was first discovered in Kazakhstan in 1911, but little oilfield development was done until the country became independent in 1991 (Arkhipov, 2010). Starting from 2001, Kazakhstan's government found itself in a position of having to develop its own economy and developing the natural resource base, the main endowment of Kazakhstan, was simply a matter of survival for the country and government (Arkhipov, 2010). Lacking the required sophistication to take advantage of their natural resources, the country began attracting FDI for the exploration and production of oil and gas (Arkhipov, 2010). Until recently, when Kazakhstan parliament enabled government to alter or cancel contracts with foreign oil companies, foreign multinationals enjoyed relatively favorable investment conditions and support from the government entities (Arkhipov, 2010).Kazakhstan has the second-largest oil reserves and the second-largest oil production among the former Soviet republics after Russia (EIA, 2017c). Kazakhstan is a considerable oil producer: as shown in table 3.9 the estimated total oil production in 2016 has been of 1.672 thousands of barrels per day (b/d).

TABLE 3.8 TOTAL PROVED OIL RESERVES IN KAZAKHSTAN*

	1996	2006	2016
Total Proved reserves (In thousand million barrels)	5.3	9.0	30.0

**Note: reserves include gas condensate and natural gas liquids as well as crude oil.*
Source: BP, 2017 pg 12.

TABLE 3.9 OIL PRODUCTION AND CONSUMPTION IN KAZAKHSTAN, IN THOUSANDS OF BARRELS PER DAY*

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Oil production	1370	1415	1485	1609	1676	1684	1664	1737	1710	1695	1672
Oil consumption	221	242	241	199	211	244	245	260	265	289	287

**Note: excludes liquid fuels from other sources such as biomass and derivatives of coal and natural gas.*
Source: BP, 2017 pg 14-15

Kazakhstan started to produce in 1911, but its output did not rise to a significant level until the 1960s and 1970s, when it reached the pre-Soviet independence record production level of nearly 500,000 b/d, then in the mid-1990s, with the help of major international oil companies, the production surpassed the 1 million b/d quantity in 2003 (EIA, 2017c). Kazakh's OIl field are the following – starting from the reacher: Karachaganak, Tengiz, Kashgan, Zhanazhol, Imashevskoye, Zhetybai, Tenge, Uzen', Urikhtau, Prorva, Kalamkas, Amangedly, Teplovsko–Tokarevskoye, Zhetybai South, Shagyrly–Shomyshty, Chinarevskoye, Korolevskoye, Tasbulat (Yenikeyeff Midkhatovich S., 2008).
The key to Kazakhstan's continued growth in liquids production from this level is the development of its giant Tengiz, Karachaganak, and Kashagan fields (EIA, 2017c).

Around 70% of Kazakhstan's oil and gas reserves, both onshore and offshore, are concentrated in Western Kazakhstan around the city of Atyrau (population of 154,000 people) (Arkhipov, 2010). On the development and expansion of its three largest projects: Karachaganak, Kashagan, and Tengiz depends the future of Kazakhstan as a producer of petroleum liquids (EIA, 2017c). In the 1970s, several large discoveries were made including Karachaganak and Tengiz, but the development of these fields was not possible at the time because of the technical challenges of developing the deep, high-pressure reservoirs (EIA, 2017c). Only later, when international oil companies began to participate in Kazakhstan's oil industry, these fields have become the basis of the country's oil industry production (EIA, 2017c).
The National Company "KazMunayGas" is present in each of the three largest projects, the company is the Kazakhstan's national operator for exploration, production, refining and transportation of hydrocarbons, and represents the state in Kazakhstan's petroleum sector (KazMunaiGas, 2018). KazMunayGas accounts fro 28% of the total crude oil and gas condensate production volume in the country and 16% of natural and associated gas, it provides for 65% of oil transportation through trunk oil pipelines, 77% of oil transportation with tankers from the port of Aktau, and 95% of natural gas transportation through trunk gas pipelines, processes 82% of the Kazakh crude oil with the retail oil product market share of 17% (KazMunaiGas, 2018).

TABLE 3.10 KAZAKH FIELDS FEATURES

Field Name	Companies	Start Year	Liquids Production
Tengiz (& Korolev)	Chevron, ExxonMobil, KazMunaiGaz, Lukoil.	1991	570,000 b/d petroleum and other liquids production in 2016. Expansion project to add 260,000 b/d of crude production beginning in 2022.
Karachaganak	BG, Eni, Chevron, Lukoil, KazMunaiGaz.	1984	206,000 b/d total liquids production in 2016. An expansion project is under consideration, but potential production volumes are uncertain.
Kashagan	KazMunaiGaz, Eni, ExxonMobil, Shell, Total, China National Petroleum Corporation, Inpex	2016	370,000 b/d liquids processing capacity with current development.

Source: EIA (2017)

Moreover, it is among the biggest employers with the number of employees of over 84,000 (KazMunaiGas, 2018). Also Chevron Company is an important player, especially for Tengiz field where it operates through the Tengizchevroil LLP Company, which was formed with the aim to explore and develop super giant Tengiz oilfield between the Republic of Kazakhstan and Chevron Corporation in 1993 (Tengizchevroil, 2018). In fact Chevron owns the 50% of the shares, whereas ExxonMobil owns the 25% and KazMunayGas the 20% (Tengizchevroil, 2018). ExxonMobil is one of the largest publicly traded petroleum and petrochemical enterprise in the world, and is present in the Kazakh field of Kashgan. In Kashgan Field operates the North Caspian Operating Company that manages the North Caspian Project: the project is developed under the North Caspian Sea Production Sharing Agreement signed by the Republic of Kazakhstan and an international consortium of major oil and gas companies in 1997 (North Caspian Operating Company, 2018). Today, the consortium includes seven of the world's largest and most experienced energy companies: KazMunayGas, Eni, Shell, ExxonMobil, Total, CNPC and Inpex (North Caspian Operating Company, 2018). Each shareholder is independently responsible for transporting and marketing its own share of production and for reporting and sharing that production with the government according to the NCSPSA (North Caspian Operating Company, 2018). Eni is also present in Kazakhstan in both the projects of Kashgan, where it partecipates under the NCSPSA with the 16,81% and in Karachagan (ENI, 2018). The operations in Karachgan are manged by Karachaganak Petroleum Operating (KPO) and regulated by a Production Sharing Agreement, where Eni participates with the 29,95% and works in cooperation with Shell (ENI, 2018).

The two largest projects, Tengiz and Karachaganak, accounted for 50% (Tengiz 35%, Karachaganak 15%) of the country's production in 2016, according to data published by Energy Intelligence (Nefte Compass, 2017).
According to Tengizchevroil[23] (TCO) data, Tengiz super giant oil field is a very important source of revenue for the country. From 1993 to the first quarter of 2017, TCO made direct financial payments of over $119 billion to Kazakhstani entities, including Kazakhstani employees' salaries, purchases of Kazakhstani goods and services, tariffs and fees paid to state-owned companies, profit distributions to Kazakhstani shareholder and taxes and royalties paid to the government (Tengizchevroil, 2017). In the first quarter of 2017, direct payments to the Republic of Kazakhstan exceeded $2.4 billion (Tengizchevroil, 2017). In July 2016, the Tengiz partners made a final investment decision to proceed with the Future Growth Project, an expansion project which is expected to be completed by 2022, it will bring about 260,000 b/d of additional liquids production from Tengiz (EIA, 2017c).
An expansion project has also been proposed for the Karachaganak field, but it is at a less-advanced stage of planning (EIA, 2017c). Karachaganak is one of the world's largest oil and gas condensate fields comes at the top of the list of Kazakhstan's gas resource base (Yenikeyeff Midkhatovich S., 2008). In 2007, Karachaganak made up 49% of Kazakhstan's gas production and 18% of oil production (Yenikeyeff Midkhatovich S., 2008). The field of over 280 square kilometres is located in the northwest by the Russian border, in a low- lying, almost flat area noted for its arable farming but traditionally considered part of the steppes (Elliott 1998), and makes up over 40% of Kazakhstan's gas potential (Yenikeyeff Midkhatovich S., 2008). In 2007, the field has already attracted over $6 billion of foreign investment.

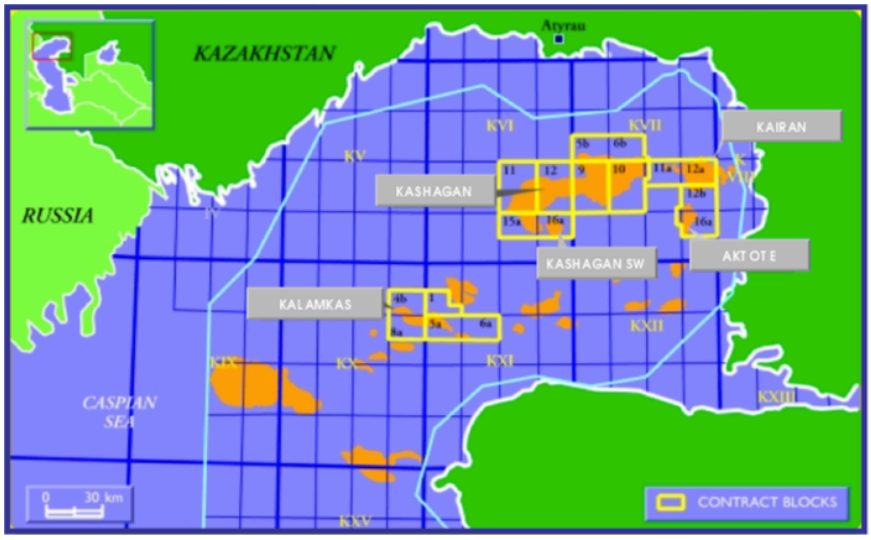
The Kashagan field, the largest known oil field outside the Middle East and the fifth largest in the world in terms of reserves, is located off the northern shore of the Caspian Sea near the city of Atyrau, Kazakhstan (EIA, 2017c). Kashagan's recoverable reserves are estimated at 7 to 13 billion barrels of crude oil (EIA, 2017c). On September 11, 2013, production from the super-giant field commenced, eight years after the originally scheduled startup date (EIA, 2017c). In October 2013, just a few weeks after production began, production had to be halted because of leaks in the pipeline that transports natural gas from the field to shore (EIA, 2017c). Production restarted in October 2016, and by January 2017, the field was producing more than 100,000 b/d of liquids (EIA, 2017c). Full capacity for the first phase of development is production of 370,000 b/d. Many of the repeated delays at Kashagan were the result of the field's adverse operating environment and complexity, resulting in significant cost overruns (EIA, 2017c).

[23] In April 1993 Kazakhstan (represented by the state company Kazakhoil, now Kazmunaigaz) and the US company Chevron formed a joint venture, Tengizchevroil (TCO). The Kazakh government granted an exclusive 40-year right to TCO to develop Tengiz and Korolevskoye hydrocarbon fields. The project will require a total investment of $23 billion. (Yenikeyeff Midkhatovich S., 2008).

FIGURE 3.5 KARACHAGANAK AND TENGIZ LOCATION IN WEST KAZAKHSTAN.

Source: Cavanna (2003)

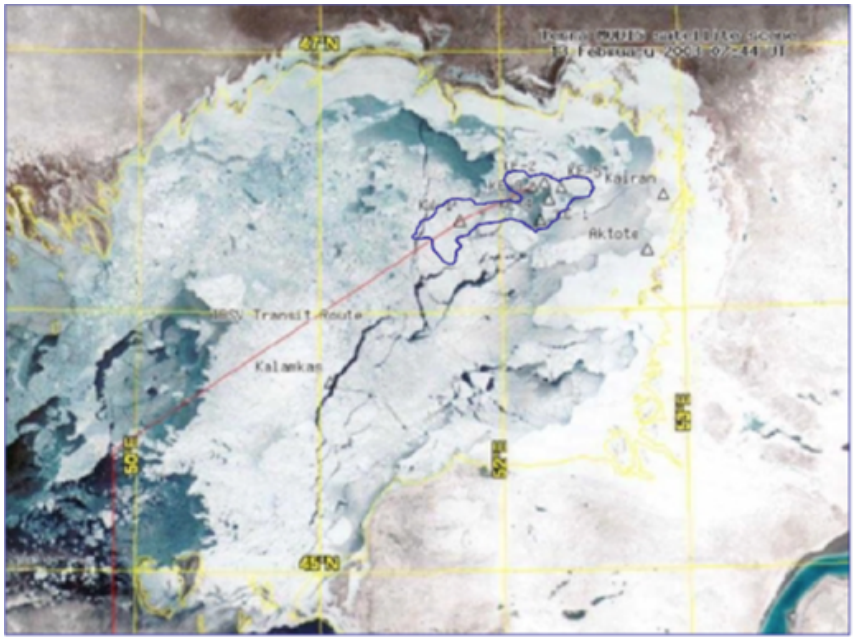
FIGURE 3.6 KASHGAN LOCATION IN CASPIAN SEA



Source: Cavanna (2003)

The Kashagan reservoir is located more than 13,000 feet below the seabed and is under very high pressure (770 pounds per square inch) and contains high levels of hydrogen sulfide – which is both highly toxic and highly corrosive and has been blamed for the pipeline leaks (EIA, 2017c). In addition, conventional drilling and production technologies such as fixed or floating platforms cannot be used because of the shallow water and very cold climate (EIA, 2017c).

FIGURE 3.7 KASHGAN FIELD IN THE WINTER SEASON



Source: Cavanna (2003)

3.2.3 Exports and Oil Export

Official export of goods for the first 9 months of 2017 amounted to 43.5 billion dollars which counts for 31.8% of the national GDP (National Bank of Kazakhstan, 2018).

TABLE 3.11 OPENNESS OF THE ECONOMY, AS A PERCENTAGE OF THE GDP (9M)*

	2015	2016	2017
Export	25.7	28.8	31.8
Import	16.8	19.6	19.3

**Note: data refers to the first nine months of the year.*
Source: National Bank of Kazakhstan (2018)

TABLE 3.12 COMMODITY STRUCTURE OF EXPORTS OF THE REPUBLIC OF KAZAKHSTAN (9M)*

COMMODITY GROUP	2016 (in millions/000 of US$)	2016 Percentage	2017 (in millions/000 of US$)	2017 Percentage
All commodities	26 220,7	100%	34 476,6	100%
Main nomenclature	24 536,1	93,6%	32 594,8	94,5%
Mineral Commodities	17 194,9	65,6%	23 833,5	69,1%
of which oil and gas condensate	14 021.0	53,5%	19 155,4	55,6%
Ferrous Metals	1 973,9	7,5%	3 142,3	9,1%
Nonferrous Metals	2 802,1	10,7%	3 384,4	9,8%
Grain	563,5	2,1%	519,0	1,5%
Other commodities	1 684,6	6,4%	1 881,7	5,5%

**Note: Data refers to the first nine months each year.*
Source: National Bank of Kazakhstan (2018) pg 30.

The increase in the value of exports in 2017 was mainly due to growth in the supply of oil and gas condensate by 5.1 billion dollars (36.6%) to 19.2 billion dollars (National Bank of Kazakhstan, 2018). The share of this group in total export volume increased by 2.1 percentage points, as a result, commodity export concentration coefficient increased from 68.3% in the base period to 71.7% in the reporting period (National Bank of Kazakhstan, 2018, appendix I. 4). Growth of value of oil and gas condensate is mainly related to increase of average contract price of crude oil by 26.7% and gas condensate by 43.8% (National Bank of Kazakhstan, 2018). Price component played a decisive role in the value growth of exports of both ferrous and nonferrous metals (National Bank of Kazakhstan, 2018):

- In the group of ferrous metals the largest price growth was recorded for ferroalloys by 58.9% to $1515 per ton and rolled ferrous metals by 28% to $555 per ton (National Bank of Kazakhstan, 2018, appendix I.5). Physical supply of these commodities grew by 7% to 1.1 million tons for ferroalloys and 29% to 2 million tons for rolled ferrous metals (National Bank of Kazakhstan, 2018).

- In the group of non-ferrous metals the largest increase of price component was recorded for zinc by 49% to $2660 per ton (National Bank of Kazakhstan, 2018). Average contract prices for aluminum also showed increase by 25.3% to $1967 per ton, for copper by 23.3% to $5522 per ton and for lead – by 21% to $2075 per ton (National Bank of Kazakhstan, 2018). Quantitative supply for aluminum increased by 9.2% while quantitative volume for coper, zinc and lead declined (National Bank of Kazakhstan, 2018).

Decrease of total grain exports (by 7.9%) was due to physical volumes reduction by 7.8% to 3.3 million tons while price component decreased insignificantly by 0.1%. World prices of wheat decreased in the reporting period by 0.3% from $172.8 to $172.3 per ton.

These data highlights the absolute importance of the mineral industry, especially the oil industry, for the country export sector. Going deeper in details regarding the oil industry, it is interesting to look at the results in figure 3.8 (pg. 73), that graphically shows the flow of crude oil production - in violet - that ends up in the export market for the year of 2015. According to the data showed in figure 3.7, Kazakhstan produced 82.73 millions of tonnes of oil, of which 65.18 millions have been exported.
According to the World Integrated Trade Solution (WITS, 2015) Data, the overall percentage of fuel's share on country's exports is 67.72% and the top five exported products to world by Kazakhstan in 2015 along with trade value are:

TABLE 3.13 TOP 5 EXPORTED PRODUCTS TO WORLD IN 2015 WITH TRADE VALUE

Product	Trade value in US$ Millions
• Petroleum oils and oils obtained from bituminou	26,773,012.92
• Natural uranium and its compounds	2,247,673.49
• Natural gas in gaseous state	1,745,528.84
• Copper cathodes and sections of cathodes unwrou	1,562,309.67
• Petroleum oils, etc, (excl. crude)	1,383,877.59

Source: WITS, 2015.

According to WITS the top five countries to which Kazakhstan exported in 2015, along with the percent of total exports that went to that country, are:

TABLE 3.14 TOP FIVE EXPORT PARTNERS IN 2015

Country	Trade Value in US$ Millions	Partner Share
Italy	8,136,263.75	18%
China	5,480,137.49	12%
Netherlands	4,980,963.56	11%
Russian Federation	4,547,502.10	10%
France	2,681,283.15	6%

Source: WITS, 2015.

Since independence, Kazakhstan has focused on the expansion and diversification of its export capabilities: the main crude oil export pipelines

include the Caspian Pipeline Consortium pipeline to the Black Sea port of Novorossiysk, the Kazakhstan-China pipeline, and the Uzen-Atyrau-Samara pipeline to Russia (EIA, 2017c). The Tengiz-Novorossiysk pipeline, which connects the Tengiz field to the Russian Black Sea port of Novorossiysk, is currently undergoing construction and aims to more than double its capacity from 28.2 million tonnes (MMT) to 67 MMT per year, with 52.2 MMT of oil from Kazakhstan (OECD, 2017). The Kazakhstan-China pipeline, which first carried oil in 2006, currently transports 12.2 MMT, and will be expanded to 20 MMT (Ernst and Young, 2014; EIA, 2015).

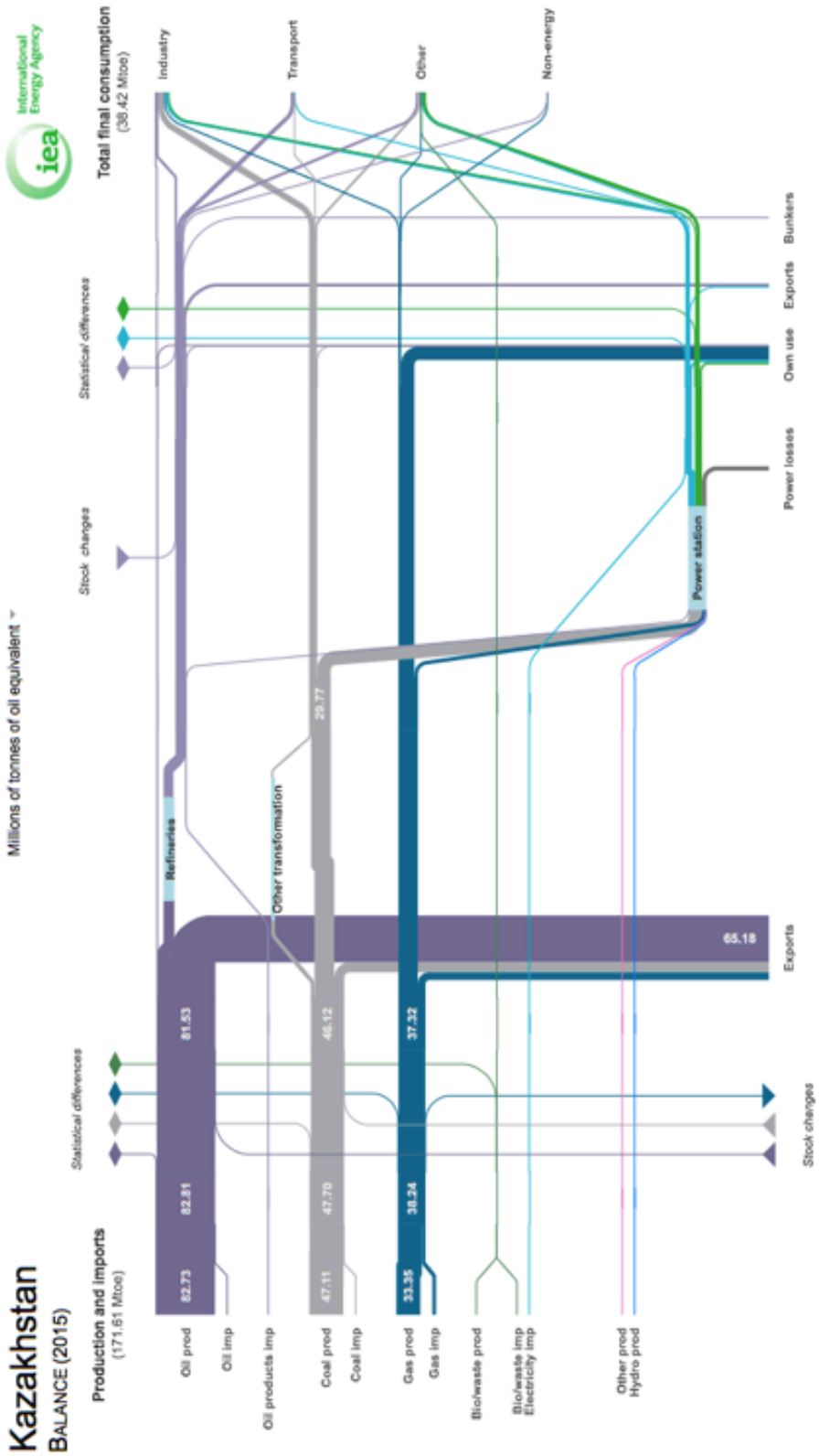
Kazakhstan also exports crude oil through the Caspian Sea: from the Kazakh port of Aktau (or the smaller Atyrau port) the tankers filled with oil start their pass-through the Caspian Sea, then they are loaded onto the Baku-Tbilisi-Ceyhan pipeline or the Northern Route pipeline (Baku-Novorossiysk) for onward transport, mainly to Europe (EIA, 2017c). Additionally, Kazakhstan has a vast rail network, used to transport liquid fuels both for domestic consumption and for exports (EIA, 2017c). The expansion and diversification of Kazakhstan's petroleum liquids transport capacity, particularly export capacity, is key to its future ability to increase production (EIA, 2017c): the Kazakhstan Caspian Transportation System, currently under construction, will help export oil from the Kashagan field as it becomes operational (OECD, 2017). The project is a mix of a pipeline from the Kazakh city of Yeskene (near the Kashagan field) to Kuryk, where tankers will transport the oil across the Caspian Sea to Baku for loading on to the Baku-Tbilisi- Ceyhan pipeline (OECD, 2017). Initial capacity will be 23 MMT per year, expandable to 56 MMT (Ernst and Young, 2014, EIA 2015).

Rail is also a major shipper of oil in Kazakhstan, moving 9 MMT of oil in 2013 (OECD, 2017). The oil-exporting infrastructure helps shape the end markets for Kazakhstan's crude (OECD, 2017). In 2013, Europe received 70% of Kazakhstan's crude, and China received 15%, as export capacity increases, China may begin receiving a greater proportion of Kazakhstan's oil (OECD, 2017).

Another potential export route for Caspian crude oil is via swaps with Iran: for many years, Kazakhstan delivered its crude oil to Iran's Caspian Sea port of Neka, then from there to refineries in Tehran and Tabriz, that later distributed and consumed products in northern Iran (EIA, 2017c). In exchange, Iran exported equal volumes of crude out of its Persian Gulf ports on behalf of Kazakhstan (EIA, 2017c). However, the swap arrangements faced some complications due both to sanctions against Iran, especially the marketing of the crude oil exported in the Persian Gulf, and to Iran's desire to raise the fee it charged Kazakhstan for each barrel of crude swapped (EIA, 2017c). Despite Iran and Kazakhstan have been discussing resumption of the swap arrangement since late 2013, no swaps had occurred as of the end of 2016 (EIA, 2017c).

Kazakhstan's pipeline system is operated by the state-run KazTransOil, a subsidiary of KazMunaiGas, which runs approximately 3,400 miles of pipelines (EIA, 2017c).

FIGURE 3.8 KAZAKHSTAN ENERGY PRODUCTION, IMPORTS AND EXPORTS IN 2015



Source: IEA Sankey Diagram, created on May 14th, 2018 at 11:49 am.

3.3 Terms of Trade

After the analysis on the main components that contribute the most in the export of Kazakhstan, this paragraph is aiming at showing the analysis of the terms of trade of the country. It focused on the period that goes from 2012 to 2017, and in so doing, it covers entirely the last oil price shock of 2014-2015. In order to conduct the analysis, the chosen formula of the Terms of trade is the one of the net barter terms of trade, as described in chapter 1:

$$N = (P_X / P_M)\ 100$$

This index measures unit gains from the trade amount: imports that are available for one unit of exports (William, 2008). Basically it expresses the relative price of the "exportable" in the terms of the "importable". The commodity terms of trade of a nation (N) are given by the ratio of the price *index* of its exports (P_X) to the price *index* of its imports (P_M). For this ratio, it is appropriate to use the term *unit value* rather than *price* because different heterogeneous commodities are aggregated into a single commodity category such as exports or imports (William, 2008). 100 usually multiply this ratio in order to express the terms of trade in percentages.

Beyond the commodity terms of trade, the most significant terms of trade for developing countries is also the income terms of trade, which shows the nations's export-based capacity to import. According to Dorrance (1948), the economist who introduced them, the important point for a country's welfare was to define the amount that it could buy with the total income generated by its exports: this concept in formula corresponds to the commodity terms of trade multiplied by the volume of exports. Consequently, a change in the income terms of trade is particularly relevant for developing countries, since they are often largely dependent on the export of their raw materials.

However, the reasons that stands behind the choice of using the net barter terms of trade instead of the income terms of trade are mainly connected to previous literature discussions as well as to data availability. In fact, according to Salvatore (2013), since the net barter terms of trade is the easiest indicator to be measured, most of the discussion in the economic literature has been in terms of net barter (see also Cashin & Patillo, 2000). Moreover, the net barter terms of trade is continuously measured for most of the countries in the world by international agencies such as International Monetary Fund, World Bank, World Integrated Trade Solution, United Nations, UNCTAD, where, indeed, it is often referred to simply as "the terms of trade" (Cashin & Patillo, 2000).

Due to these practical reasons, the choice has been driven to the more convenient use of the net barter terms of trade.

3.3.1 Data Analysis and Results

The Export and Import Data on the basis of the Balance of Payments of the Republic of Kazakhstan are the following:

TABLE 3.15 ANALYTIC EXPORTS AND IMPORTS DATA (MILLIONS/000 OF DOLLARS FOR THE PERIOD)

	2012	2013	2014	2015	2016	2017
EXPORTS	**91 759,3**	**90 980,2**	**86 927,6**	**52 991,9**	**43 569,3**	**40 027,8**
of goods on a balance of payments basis	*86 931,1*	*85 595,4*	*80 309,5*	*46 515,9*	*37 262,5*	*35 191,1*
of services	*4 828,2*	*5 384,7*	*6 618,1*	*6 476,0*	*6 306,8*	*4 836,7*
EXPORTS % OF GDP	44,1	38,4	39,3	28,7	31,7	36,9
IMPORTS	**61 543,9**	**63 261,6**	**56 980,2**	**45 426,7**	**39 132,2**	**31 140,8**
of goods on a balance of payments basis	*48 785,8*	*50 803,2*	*44 064,0*	*33 844,4*	*28 069,3*	*23 184,8*
of services	*12 758,1*	*12 458,4*	*12 916,2*	*11 582,2*	*11 62,8*	*7 956,0*
IMPORTS% of GDP	29,6	26,7	25,7	24,6	28,5	28,7

Source: National Bank of Kazakhstan (2018), Appendix 5 pg 13.

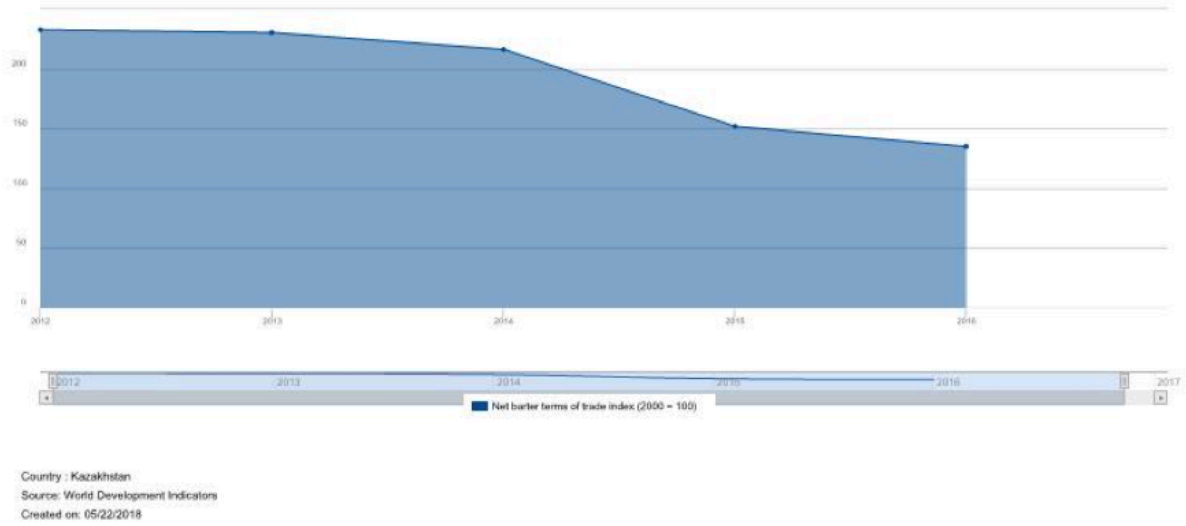
The elaboration of the terms of trade, using the formula of the net barter, needs the use of Unit Value Index of Exports and Imports, calculated by the UNCTAD Statistics.

TABLE 3.16 TERMS OF TRADE INDEX CALCULATIONS FROM 2012 TO 2016*

	2012	**2013**	**2014**	**2015**	**2016**
Unit Value Index of Exports	391,0054	380,3158	353,3482	227,2695	195,3908
Unit Value Index of Imports	168,0504	165,1795	163,4351	149,719	144,8224
Terms of Trade	232,6715	230,244	216,2009	151,7973	134,9175

**Note: Net barter terms of trade index is calculated as the percentage ratio of the export unit value indexes to the import unit value indexes, measured relative to the base year 2000. The value index is the current value of exports (FOB) or imports (CIF) converted to U.S. dollars and expressed as a percentage of the base period (2000). The volume index is derived as the percentage ratio of the export or import value index to the corresponding unit value index (value index / unit value index *100) unless otherwise noted at country level.*
Source: UNCTADStat (2018).

FIGURE 3.9 NET BARTER TERMS OF TRADE INDEX (2000=100) FROM 2012 TO 2016



Source: Author's elaboration on World Development Indicators Databank tool (2018).

As shown in Figure 3.8, the trend in the net barter terms of trade from 2012 to 2016 has been negative. A decrease in the terms of trade means that the value of exports is decreasing relatively to the value of imports. With the smaller revenue from its exports, the country have to buy less imports. In fact, not only exports diminished, but also imports, as reported in Table 3.15. It is interesting to notice that the exports diminution has been stronger than the imports one: in 2017 exports, more than halved compared to the pre oil price shock level in 2014.

The reasons of the terms of trade shock lay on the country's dependence on oil as a major source of exports revenue: falling export oil prices led to a large terms-of-trade shock, and at the same time, as China's growth slowed and Russia's recession continued, both the external and domestic demand resulted weakened (World Bank, 2016). As a result, import prices increases, driving inflation in 2015 and 2016.

In August 2015 the authorities took the decision to move to a flexible exchange rate, consequently in the fourth quarter of 2015 started the depreciation of the Kazakhstani tenge (KZT), which led to considerable adjustments of imported goods prices (World Bank, 2017c). The key drivers of inflation in 2016 have been: imported clothing and footwear, medicine, and household appliances, which registered price increases of over 20%; moreover, the earlier removal of price controls for certain kind of gasoline also contributed to the raise of domestically-produced goods and services prices. In the same year the inflation rate averaged on the 14.6%, reaching its highest point in the third quarter (17.3%) (World Bank, 2017c).

The pass-through effects from the currency devaluation began to ease in the last quarter of 2016, when the headline inflation rate declined from over 17% in the third quarter of 2016 to 7.9% in early 2017 (World Bank, 2017c).

In 2016 the external position improved, mainly supported by an increase in FDI inflows.
In fact, the current account deficit, that widened due to the unfavorable terms of trade, was offset by higher net FDI inflows, mainly channeled into the oil industry to expand the production capacity (World Bank, 2017c). In particular, according to the World Bank Group Data (2017c) regarding the Balance of Payments: lower oil prices and oil output resulted in a relevant broadening of the current account deficit from US$5.5 billion (3% of GDP) in 2015 to US$8.2 billion (6.1% of GDP) in 2016. However, investments operated by Tengizchevroil and Karachaganak to expand oil production capacity increased the net FDI inflows to US$14.3 billion (10.7% of GDP), counteracting the deterioration of the current account deficit (World Bank, 2017c). As a consequence, the overall deficit of the balance of payments, excluding the investment made by the Oil Fund, narrowed significally from US$10.6 billion in 2015 to $2.4 billion in 2016 (World Bank, 2017c). The better external position helped the central bank of Kazakhstan to refill international reserves, that had been used for foreign moderate exchange interventions in 2016 (World Bank, 2017c).

The oil price recovery in 2017 changed the picture of the country, further underlining its dependence on the resource. As described in paragraph 3.2.1, in the first nine months of 2017 real GDP growth accelerated by 4.3% year on year (compared to the 0.4% growth in the same period of 2016) (World Bank, 2017d). According to the World Bank (2017d), growth improved thanks to the strengthening external environment, which has brought a recovery in the oil sector, supported by the production launch of the Kashagan offshore oil field in the Caspian Sea and higher oil prices, which had positive spillover effects on the non oil economy (World Bank, 2017d).
The material recovery in exports of oil lead to a higher net exports' contribution to GDP growth: from 26.8 US$ billions in 2016 to 35.1 US$ billions in 2017 (World Bank, 2017d). Moreover, the ongoing economic recovery in the Russian Federation and higher oil demand from the EU countries contributed the growth in external demand (World Bank, 2017d). Meanwhile, the growth slowdown in China continued to impact negatively on external demand for Kazakhstan's commodities (World Bank, 2017d). These dynamics helped the increase of the terms of trade, favoring the account deficit, as described in Figure 3.10.

FIGURE 3.10 BALANCE OF PAYMENTS AND OFFICIAL RESERVES 2015-2017 (US$ BILLIONS)

	2015	2016	2016 Jan-Sep	2017 Jan-Sep
Current account balance	**-5.1**	**-8.9**	**-6.0**	**-5.0**
Merchandise trade	12.7	9.2	6.8	12.0
Exports f.o.b.	46.5	37.3	26.8	35.1
Of which: Oil and gas	31.1	22.3	15.5	21.0
Imports f.o.b.	33.8	28.1	20.0	23.1
Services	-5.1	-4.8	-3.4	-3.4
Primary income	-11.1	-13.0	-9.1	-13.2
Income of direct investors, net	-8.6	-11.0	-7.6	-11.5
Secondary income	-1.6	-0.4	-0.3	-0.4
Capital and financial account balance /1/2	**-5.4**	**6.5**	**7.4**	**1.3**
Direct investment	2.9	13.5	11.6	3.3
Portfolio investment /1	-3.9	-2.9	-1.6	4.3
Medium- and long-term investment	4.3	4.2	3.1	0.0
Short-term investment	-3.7	-8.4	-4.8	-5.1
Errors and omissions	-5.1	-0.2	-1.1	-1.4
Overall external balance	**-10.6**	**-2.4**	**1.4**	**-3.7**
Change in FX assets in the Oil Fund	-9.8	-2.2	1.1	-4.2
Change in FX reserves at the NBK	-0.8	-0.3	0.2	0.4
Memorandum items:				
Stock of official reserves	**91.3**	**90.7**	**95.8**	**89.3**
Stock of FX assets in the Oil Fund	63.4	61.2	64.5	57.1
Stock of FX reserves at the NBK	20.3	19.9	20.6	20.2
Gold reserves	7.6	9.6	10.6	12.0

Source: World Bank Group, 2017b pg 5. Note: Some sums may not add up exactly due to rounding; 1/ Excluding net investment of the Oil Fund; 2/ Including errors and omissions; 3/ Annual estimates.

Figure 3.10 shows how the account deficit narrowed by US$1 billion during the period of 2017 (compared to the same period of 2016), mainly due to more favorable terms of trade, counterbalanced in some measure by profit repatriation, of which more than half was reinvested as FDI into Kazakhstan (World Bank, 2017d). At the same time, the surplus on the capital and financial accounts decreased by about US$6 billion (excluding Oil Fund transactions), pushed down by lower net inflows of FDI (World Bank, 2017d). Even if the foreign companies reinvested profits in the oil sector, the National Bank of Kazakhstan reported an important growth in repayments of intra-company loans that more than offset FDI inflows (World Bank, 2017d).

Anyway, despite the oil price recovery that helped to reduce the account deficit in the first nine months of 2017, the overall balance of payments deteriorated.

On domestic demand: private consumption grew after lower inflation pushed up consumer confidence, and government transfers to households (especially pensions and other social transfers) increased (World Bank, 2017d). On public investment: after two years of cuts in capital spending, it increased by more than 13% year-on-year (in real terms) in the first nine months of 2017, mainly on transports and communications for launch of EXPO-2017 that lasted all the summer of 2017 (World Bank, 2017d).

The inflation rate declined compared to the 2016, but inflationary pressures increased in late 2017: from a 7% in August 2017 to 7.1% in September and 7.7% in October, mainly due to gasoline prices (World Bank, 2017d). In fact, with the share of imported Russian gasoline (priced in U.S. dollars) reaching the 40% of the total, the currency depreciation led to both higher prices of domestic gasoline and temporary gasoline shortages in some areas of the country (World Bank, 2017d). As a consequence, the currency depreciation and higher gasoline prices drove up prices for other goods and services (World Bank, 2017d).

The analysis of the dynamics of terms of trade during and after the oil price shock, highlights the strong dependence of the country of Kazakhstan on the trend of its oil exports, and consequently, its exposure to external risks – in particular to the volatility of oil price. In order to strengthen the economy of a relatively young country, a solution can be found in the diversification of the economy. In fact, the president called for a new wave of economic transformation, the “Modernization 3.0”, with the goal of becoming more globally competitive and joining the ranks of the world's 30 most developed countries by 2050 (World Bank, 2017d). President Nazarbayev outlined five priorities for economic transformation, as reported by the World Bank (2017c): “(i) accelerated technological modernization of the economy; (ii) improved business environment; (iii) increased macroeconomic stability; (iv) enhanced quality of human capital; and (v) strengthened institutions, security and anti- corruption efforts” (World Bank, 2017c). The address emphasize the need to diversify the economy from commodity exports and to improve both productivity and the effectiveness of the state apparatus (World Bank, 2017c).

CHAPTER 4 - THE PATH TOWARD A DIVERSIFIED ECONOMY

The terms of trade indicate that swings in the oil prices largely impact on the economy of the country: since the impressive economic growth in Kazakhstan between 2000 and 2014 grew increasingly dependent on natural resources, and oil in particular, the revenue from the extractive sector is a major input to the government budget, but the booms and busts make long-term government planning difficult (OECD, 2017). In 2014 government revenue from the extractive sector amounted to almost USD 27 billion (EITI, 2015), and USD 30 billion in 2013, constituting approximately half of total government revenue, but in 2015, declining oil prices led the government to revise the budget twice (OECD, 2017). In October 2015, President Nazarbayev said that the continuing decline in commodity prices had reduced government revenues by 40%, and warned that Kazakhstan was on the brink of a crisis more dangerous in scope than the global economic downturn of 2007-2009 (Farchy, 2015). In February 2016, the budget was revised to reflect an estimated cost of USD 30 per barrel (Reuters, 2016).

The oil sector has generated a much smaller share of growth since the mid-2000s (OECD, 2016) and especially since 2010 (OECD, 2017). High degrees of concentration of activity in natural resources expose the economy to external shock, diversification can help buttress a more stable and resilient growth path (OECD, 2017). However, moving to a higher-quality development path requires that the conditions are put in place for structural transformation to happen (OECD, 2017).

After the decrease in oil prices in 2014, Kazakhstan's main short-term economic policy challenge is to adjust to the new reality of slower growth and lower income for the near future (OECD, 2017). The long-term development policy challenge is to transform the country's growth model away from from reliance on natural resource extraction towards a more diversified, competitive economy (OECD, 2017). In fact, Kazakhstan is undergoing reform to realize its aspiration of becoming one of the top 30 global economies by 2050 (OECD, 2017). It aims to have a competitive and diversified market economy that can respond and adapt to the changing global environment, and to provide a high
standard of living for its citizens (OECD, 2017). In this frame, the country is pushing investment in different sectors. President Nazarbayev named agriculture "a new driver of the economy" in his address to the nation, the Modernization 3.0, in 2017(World Bank, 2017c). In fact, the country has a very high potential to boost gains and to create new jobs in the agriculture sector, which could be a pillar in the process of economic diversification by rising the competitiveness of its rural activities and adding additional value to output through processing (World Bank, 2017c). Moreover, the labor productivity in agriculture - lower than the level of Russia and Belarus - meets significant opportunities to increase, and not-utilized land - around 15% of the arable land area and an undetermined area of Kazakhstan's grazing land - can be better employed (World Bank, 2017c). Kazakhstan is strategically located to deal with traditional markets in the Central Asia region as well as growing markets in China, India and the Middle East (World Bank, 2017c). These elements, in

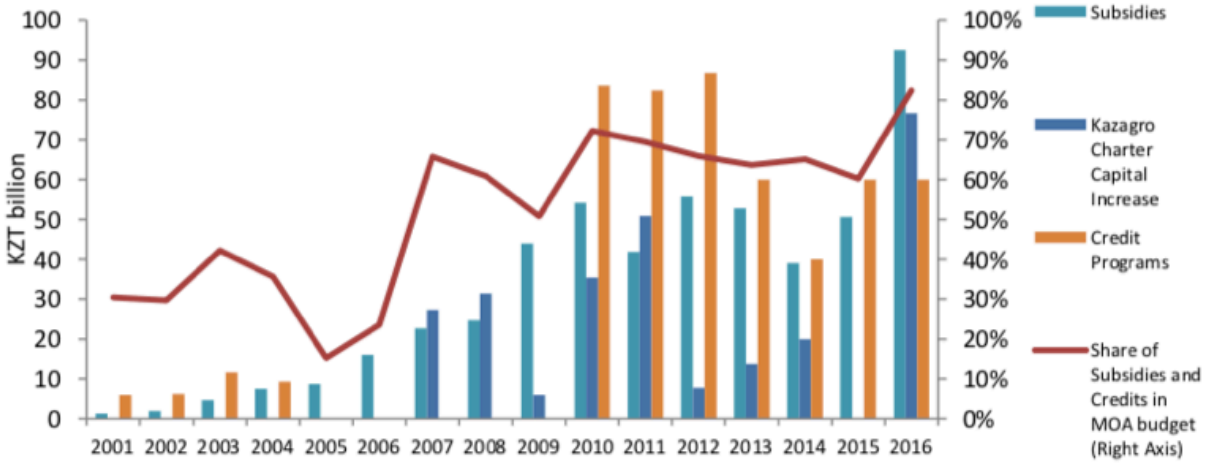
addition with the proportion of available agricultural resources, contribute in making Kazakhstan a potentially attractive investment for domestic and foreign investors (World Bank, 2017c).

Kazakhstan has a total cultivated area of 23.48 million hectares (ha) and 181 million ha of grazing lands, one of the largest in the world, about 55% of the 2.4 million ha irrigated during the Soviet time is currently in use (World Bank, 2017c). The agriculture sector grew the 4.4% on average in 2001-16, despite it fell below the average GDP growth during most of the period, and its performances have been influenced in part by climatic conditions (World Bank, 2017c). The share of agriculture sector in the country's GDP decreased gradually until 2010, when it stabilized at 4.5% level (World Bank, 2017c). Moreover, since it involves nearly one-fifth of the working-age population, the sector has a crucial role for addressing food security and poverty reduction (World Bank, 2017c).
The sector is structured as follows: household plots, a non-registered subsistence form of production, provide approximately more than the 50% of the total agricultural output, and nearly three quarters of total milk and meat production; in addition household plots also dominate the livestock sector, which counted for the 44% of agricultural output in 2015 (World Bank, 2017c). In contrast, large agricultural firms of over 10,000 ha control almost half of grain production: the three largest holding companies cultivate in more than 700,000 ha fields each and the 15 top holding companies cover the 35% of the region's sown wheat-growing area, located in the north of the country (World Bank, 2017c).

Another formal mean of agricultural production is the individual farm, a simple version of agricultural enterprises, whose share in agricultural production, rising over years, reached the 29% in 2016 (World Bank, 2017c).
The huge potential of agriculture has been recognized by the Kazakh government with budget allocations in the form of various subsidies and subsidized credits, even if they are not always most efficient and well-targeted, in order to support the production (World Bank, 2017c). In addition, in 2006, increasing the quantity of channeled funds into the agriculture sector, the government established the national holding KazAgro, that through its subsidiary organizations uses and promotes charter capital for various subsidy and credit programs (World Bank, 2017c).

As shown in Figure 4.1 the government support to the agriculture sector increased in 2006, due to KazAgro creation, and has remained at a quite elevated level, however, total subsidies, credits and transfers to KazAgro represented more than 80 percent of the Ministry of Agriculture's budget in 2016 - water management and forestry related expenditures are excluded (World Bank, 2017c).

FIGURE 4.1 GOVERNMENT SUPPORT TO AGRICULTURE



Source: World Bank Group 2017a pg. 22.

However, a lot more work needs to be done: despite a growth in agricultural output and numerous injections of budgetary financing, in the 2000s Kazakhstan became a net agro-food importer, as the economy was growing and the real exchange rate faced an appreciation (World Bank Group, 2017a). In the mid-2000s variable increases in wheat and flour exports along with dairy, sugar and processed products increased imports, resulted in a rise in the overall volume of the agro-food trade (World Bank Group, 2017a). The agro-food trade deficit reached its maximum in 2011, then it started to decrease steadily because of the reduction in the spending on imports due to a depreciation of the tenge (World Bank Group, 2017a). With regards to market partners, trade has diversified through a reduction in the share of exports to Russia and an expansion in the share of exports to Afghanistan, Central Asia, Turkey, the Middle East and Egypt (World Bank Group, 2017a). The sector of the agro-food industry (or processing agriculture), which represents only about a half of total agricultural production, will need to upraise significantly in order to became a real growth driver, along with consistent investment focused on resolving the climatic and infrastructural problem in order to achieve an affordable logistics (World Bank Group, 2017a). Despite the government's *Agro-Industrial Development Program 2017-2021* recognizes the huge significance of the agro-food industry for the economy of the country, it lacks sufficient details on practical ways to assist the sector's development, more definite measures and policies could include particular funds to leverage private investment in the industry, a better financial access, and the admission of standards of production facility to boost investors' confidence (World Bank Group, 2017a).

Beyond agriculture, Kazakhstan has been interested in another sector of investment, especially during the last year: the Green energy.

It is important to remind that the reliance on extractive industries may reduce the scope for innovative growth, as the scope for knowledge spillovers to other sectors is limited (OECD, 2017). Technology, human capital and knowledge from these industries tend to be highly sector-specific and may not be easily transferred to other productive uses (OECD, 2017). Adverse impacts of pollution from coal-based energy production and heavy industry have a cumulative long-term impact on the productivity of natural resources and result in significant negative impacts on the health of the population (OECD, 2017). For example, using monitoring station data from major cities in Almaty, Karaganda, Pavlodar and Ust-Kamenogorsk oblasts – on ambient air concentrations of total suspended solids – it was estimated that particulate matter pollution causes approximately 2 800 premature deaths and costs the economy over USD 1.3 billion annually (0.9% of GDP) in terms of increased health care costs (World Bank, 2013).

Given the challenges of the economy diversification and pollution reduction, Kazakhstan has undertaken steps to move towards a more sustainable model of development (OECD, 2017). These steps were outlined in two key strategic documents: the 2012 “Kazakhstan 2050 Strategy” and the 2013 “Green Economy Concept” (GEC).

The GEC implicitly identifies the nexus between modernized environmental stewardship and economic growth: the changes envisioned in the document involve realignment of economic priorities and mechanisms that not only protect the environment but also constitute more viable and effective means for economic development (Government of Kazakhstan, 2013). The GEC has set the goal that its transition into the green economy will increase GDP by 3%, and create more than 500 000 new jobs by 2050. Job creation can be found in five industrial clusters: “green construction”, “agriculture”, “new technologies in the energy sector”, “waste management” and “closed-loop material handling”, as well as “public water supply and
water management” (Government of Kazakhstan, 2013).

The document sets also specific emission reduction and energy targets such as:

- reducing the economy-wide energy intensity of GDP by 50% in 2050 compared to 2013;
- ensuring that the share of alternative sources in electricity production is at least 50% by 2050;
- reducing the CO2 emissions intensity of GDP in the production of electricity by 65% by 2050 (Government of Kazakhstan, 2013).

The GEC indicates that the total amount of investment required to implement the Concept from now until 2050 will be on average USD 3-4 billion per annum (Government of Kazakhstan, 2013). It further states, “The largest share of these investments (slightly more than USD 90 billion or three quarters of the total investment over the whole period until 2050) will be used for implementing energy-efficient measures and developing renewable energy as well as establishing gas infrastructure.

Measures aimed at developing agriculture, water and waste management will be less demanding in terms of financing" (Government of Kazakhstan, 2013).
Implementation of the GEC has faced serious challenges, similar to those encountered in the previous attempts to mobilize support for greening economic growth, which include the 2005 Concept on Kazakhstan's Transition to Sustainable Development, the 2010-14 zhasyl Damu (GreenDevelopment/ Growth) Programme, or the 2012 National Green Growth Plan (OECD, 2017).
These challenges include:

- top-down and command-and-control approach based often on the Soviet standards of regulation, combined with frequent incidents of corruption to avoid heavy-handed non-compliance response;
- limited use of market-oriented, compliance promotion and information-based instruments to incentivize companies to invest in pollution reduction and technology modernization;
- lack of willingness by local authorities to implement green reform because of fears of a decrease in the revenues from emissions payments or their reallocation away from local budgets;
- strong vested interests in the energy-intensive sectors, such as domestic electric power, mining or chemical industries, in not allocating their own resources to the improvement of their environmental performance (OECD, 2017).

However, Kazakhstan sent an explicit message to the world about being at the forefront of future energy development and believing in a greener future with the organization of EXPO 2017 whose theme has been Future Energy in the city of Astana, from the 29th of June to the 5th of the September of 2017 (EXPO, 2017). The EXPO, with national pavilions showing each state's efforts in improving environmental friendly energy, promoted events focused on climate change and new energies sources. In the frame of the Future Energy Forum "Building the Future, Changing the Planet", the seminars have been designed to inform about financing green energy investment, to foster participation and exchange, and to actively create a global platform for a prosperous future of renewable energy (EXPO, 2017). Today, in the EXPO site is situated the Astana International Financial Centre (AIFC) that, with the support of the European Bank of Reconstruction and Development (EBRD) and the Ministry of Economic Affairs and Employment of Finland, aims to become a regional hub for green finance (AIFC, 2018). The overall objective of the project is to enable Kazakhstan to achieve the ambitious targets set out in the Green Economy Concept (AIFC, 2018). The purpose is to mobilize sufficient volumes of domestic and international green finance and establish an array of financial services that are required to make the necessary investments in low-carbon technologies, energy efficiency and renewable energy feasible (AIFC, 2018).

Conclusions

This thesis examines the impact of oil price shocks in the terms of trade of the country of Kazakhstan, an emerging country whose economy is reliant on the oil industry. The analysis has been carried out with the use of the net barter terms of trade, the calculations cover the period from 2012 to 2016, in order to show the dynamics that invested this index during the oil price shock that happened in 2014-2015. The evidences show a negative trend of the terms of trade that started in the end of 2013. The reasons of the decline in terms of trade lay on the country's dependence on oil as a major source of exports revenue: mineral commodities represents the 65,6% of Kazakh exports, in particular oil and gas condensate represents 54,5% of total exports, consequently, a falling export oil prices easily led to a large terms-of-trade shock. As a result, import prices increases, driving inflation in 2015 and 2016.

Moreover, the analysis also shows that the oil price recovery in 2017 changed the picture of the country, further underlining its dependence on the resource. In the first nine months of 2017 real GDP growth accelerated, thanks to the strengthening external environment, which has brought a recovery in the oil sector, supported by the production launch of the Kashagan offshore oil field in the Caspian Sea and higher oil prices. The analysis of the dynamics of terms of trade during and after the oil price shock, highlights the strong dependence of the country of Kazakhstan on the trend of its oil exports, and consequently, its exposure to external risks – in particular to the volatility of oil price.

In order to strengthen the growth of a relatively young emerging country, a solution can be found in the diversification of the economy. In fact, the government called for a new wave of economic transformation, with the goal of becoming more globally competitive and joining the ranks of the world's 30 most developed countries by 2050.

The sector of agriculture has been defined as "a new driver of the economy" by the President Nazarbayev in his 2017 address to the nation, the Modernization 3.0. Kazakhstan has a very high potential to raise rural incomes and create jobs by improving the competitiveness of its agriculture sector and adding additional value to output through processing. The government supported the development of the sector with significant budget allocations in the form of various subsidies and subsidized credits, even if they are not always most-efficient and well-targeted. Moreover, funds have also been channeled to the sector through the national holding, KazAgro, which was established in 2006 and uses charter capital for various subsidy and credit programs through its subsidiary organizations. The path of agriculture towards being a new driver of economy, however, is still steep: the development of the agro-food industry and processing agriculture needs to pick up significantly, and further investment in the resolution of climatic and infrastructural problems are needed to build an affordable logistic.

Beyond agriculture, also the Green energy sector is fundamental for the long-term growth of the country and for the diversification of its economy and its energy sources as well. In 2013 the government of Kazakhstan approved the Green Economy Concept document, whose goal is a transition into a green

economy by 2050, that would increase GDP by 3%, and create more than 500 000 new jobs, envisioning job creation in five industrial clusters: “green construction”, “agriculture”, “new technologies in the energy sector”, “waste management” and “closed-loop material handling”, as well as “public water supply and water management”.

However, the need to diversify the economy away from commodity exports to raise productivity and improve the effectiveness of the state apparatus, can be met if also other actions are taken with a certain priority: a) accelerated technological modernization of the economy; b) improved business environment; c) increased macroeconomic stability; d) enhanced quality of human capital; and strengthened institutions, security and anti- corruption efforts.

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