Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics

Diploma Thesis

Macroeconomic situation vs developmental trends in crude oil production and trade: the case study of Kazakhstan

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Faculty of Economics and Management

DIPLOMA THESIS ASSIGNMENT

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Macroeconomic situation vs developmental trends in crude oil production and trade: the case study of Kazakhstan

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Objectives of thesis

The main aim of the present Master thesis is to identify key developmental trends in crude oil production and trade on the example of Kazakhstan. Since the Republic of Kazakhstan is richly endowed with natural resources and oil production can be referred to as a central to the economy of Kazakhstan (when export revenues from oil and gas constitute more than a half of total exports), it becomes interesting to define main factors affecting crude oil production in this country and identify links (if any) connecting selected macroeconomic indicators with the production of crude oil.

Thus, partial goals of the Master thesis can be formulated the following way:

1. To conduct a brief retrospective analysis of the Kazakhstan's economy focusing on its macroeconomic indicators.
2. To analyze the current state of oil producing industry in Kazakhstan.
3. To define main importers of Kazakhstan's crude oil and gas.
4. To evaluate the relationships among macroecomic indicators and oil industry in the Republic.

Methodology

Theoretical part of the Diploma thesis will be mainly based on a relevant literature review (represented by printed literature, scientific articles, surveys, web sources) and the research of similar studies, using methods such as abstraction, inductive reasoning, analysis, synthesis and deduction.

Practical part will contain descriptive statistical analysis and qualitative thematic synthesis of the main economic indicators and selected for the analysis variables. The results of the econometric regression analysis along with other main results will be provided and discussed in the Diploma's conclusion.

The proposed extent of the thesis

60-80 pages

Keywords

Kazakhstan, Crude oil, Macroeconomic indicators, Economic performance

Recommended information sources

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Electronic approval: 15. 2. 2021

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Dean

Prague on 30. 03. 2021

Declaration

I declare that I have worked on my diploma thesis titled " Macroeconomic situation vs developmental trends in crude oil production and trade: the case study of Kazakhstan " by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 31.03.2021   _____

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I would like to thank Mgr. Elena Kuzmenko, Ph.D. and all other persons, for their advice and support during my work on this thesis.

Macroeconomic situation vs developmental trends in crude oil production and trade: the case study of Kazakhstan

Abstract

The oil industry is the leading branch of the global fuel and energy industry. Namely in Kazakhstan, where the oil industry is one of the most important sectors of its economy. This thesis analyzes the country's macroeconomic performance and trends in crude oil production and trade. It is interesting to observe the role of the oil and gas business in the modern economy, based on the current trends in the development of oil and gas production. The thesis also examines the current state and development prospects of the oil and gas sector of the Republic of Kazakhstan. The development of oil trade in Kazakhstan is considered and the main importers of Kazakhstan's crude oil are identified. Then, using the data for 2000-2019, a regression analysis is performed to determine whether there is a relationship between the endogenous variable Volume of oil and gas production and exogenous variables: GDP, billions of US dollars; Inflation%; Unemployment%; Foreign direct investment, billion dollars; Central Bank interest rate (weighted average for the year); External debt level (USD billion). The obtained values show that the strongest influence on the volume of oil and gas production in this case is the value of GDP.

Keywords: Kazakhstan, Crude oil production, Trade, Macroeconomic indicators, Regression analysis

Makroekonomická situace vs. vývojové trendy v produkci a obchodu s ropou: případová studie Kazachstánu

Abstrakt

Ropný průmysl je vedoucím odvětvím globálního palivového a energetického průmyslu. Zejména v Kazachstánu, kde je ropný průmysl jedním z nejdůležitějších odvětví jeho ekonomiky. Tato práce analyzuje makroekonomickou výkonnost země a trendy ve výrobě a obchodu s ropou. Je zajímavé sledovat roli obchodu s ropou a zemním plynem v moderní ekonomice na základě současných trendů ve vývoji těžby ropy a zemního plynu. Práce také zkoumá současný stav a vyhlídky na rozvoj ropného a plynárenského sektoru v Kazašské republice. Uvažuje se o vývoji obchodu s ropou v Kazachstánu a jsou identifikováni hlavní dovozci kazašské ropy. Poté se s využitím údajů za období 2000–2019 provede regresní analýza, aby se zjistilo, zda existuje vztah mezi endogenní proměnnou Objem produkce ropy a plynu a exogenními proměnnými: HDP, miliardy amerických dolarů; Inflace%; Nezaměstnanost%; Přímé zahraniční investice, miliardy dolarů; Úroková sazba centrální banky (vážený průměr za rok); Úroveň zahraničního dluhu (v miliardách USD). Získané hodnoty ukazují, že nejsilnější vliv na objem těžby ropy a plynu má v tomto případě hodnota HDP.

Klíčová slova: Kazachstán, těžba ropy, obchod, makroekonomické ukazatele, regresní analýza

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List of abbreviations

UK   United Kingdom
GDP   Gross domestic product
KASE   Kazakhstan Stock Exchange
OPEC   Organization of the Petroleum Exporting Countries
USA   The United States of America
EAEU   The Eurasian Economic Union
JSC   Joint-stock company
COVID-19   Coronavirus Disease 2019
GNP   Gross national product
CIS   Commonwealth of Independent States
USD   United States dollar
US   United States

1 Introduction

Oil was, is and will remain the main source of primary energy in the foreseeable future, the consumption of which is steadily expanding in connection with the further development of the world economy. This thesis is devoted to the analysis of macroeconomic indicators of the Republic of Kazakhstan as well. The Republic of Kazakhstan plays an important role in the world oil market. Kazakhstan, possessing significant reserves of hydrocarbons (about 3% of the world's reserves), is among the 15 leading countries in the world that produce these raw materials, along with the countries of the Middle East, Russia, Venezuela, China, Norway, and Canada, UK, Indonesia and Brazil.

This document will first look at some of the foundations of the oil industry, as well as their main development trends in the world. It also discusses the impact of fluctuations in oil prices on economic development in the world, which clearly demonstrates changes in world oil prices, as well as their impact. The theoretical part will also include research on current trends in the development of oil production and trade in Kazakhstan. The fundamentals and concepts of macroeconomic indicators are also included in the theoretical part of this dissertation.

The practical part of this dissertation will contain a brief retrospective analysis of the economy of Kazakhstan with an emphasis on its macroeconomic indicators. An overview of oil and gas production in Kazakhstan will be presented to identify the volumes of crude oil production and exports, as well as their main oil importers.

Further analysis will focus on crude oil and gas production in Kazakhstan, with an emphasis on identifying any links with macroeconomic indicators. The thesis will consider in detail how GDP, Inflation, Unemployment, Foreign Direct Investment, Central Bank interest rate, as well as the level of External debt affect the Volume of oil and gas production. To establish the relationship between these variables, if any, will be used regression analysis.

2 Objectives and Methodology

2.1 Objectives

The main aim of the present Master thesis is to identify main developmental trends in crude oil production and trade on the example of Kazakhstan. Since the Republic of Kazakhstan is richly endowed with natural resources and oil production can be referred to as a central to the economy of Kazakhstan (when export revenues from oil and gas constitute more than a half of total exports), it becomes interesting to define main factors affecting crude oil production in this country and identify links (if any) connecting selected macroeconomic indicators with the production of crude oil.

Thus, partial goals of the Master thesis can be formulated the following way:

1.   To conduct a brief retrospective analysis of the Kazakhstan's economy focusing on its macroeconomic indicators.

2.   To analyze the current state of oil producing industry in Kazakhstan.

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4.   To evaluate the relationships among macroeconomic indicators and oil industry in the Republic.

2.2 Methodology

Theoretical part of the Diploma thesis will be mainly based on a relevant literature review (represented by printed literature, scientific articles, surveys, web sources) and the research of similar studies, using methods such as abstraction, inductive reasoning, analysis, synthesis and deduction.

Practical part will contain descriptive statistical analysis and qualitative thematic synthesis of the main economic indicators and selected for the analysis variables. The results of the econometric regression analysis along with other main results will be provided and discussed in the Diploma's conclusion. All data have been taken from various resources in the time period of 2000-2019.

3 Literature Review

3.1. Structural changes in the oil and gas industry in the modern economy

3.1.1 The role of oil and gas business in the modern economy

Crude oil plays the most significant role in the development of the world economy and international trade. Almost all states are actively producing oil, exploring hard-to-reach deposits, making significant investments in the development of the fuel and energy complex.

Crude oil is one of the most important resources on the planet, because, firstly, it is considered the main fuel resource, and, secondly, it is an excisable resource.

The value of petroleum energy lies in its properties: it is easy to extract, process, transport, store, and use. At that time, the main competitor to oil was coal, which is very difficult to process and transport, electricity cannot be stored, and natural gas is diffuse energy with a low concentration. Thus, oil is the best energy resource because it is highly mobile, which is why oil plays an exceptional role in the global energy sector.

Oil is the most important energy source of the twenty-first century, it is used in all countries of the planet, and it seems that dependence on it continues. Developed countries were theoretically able to reduce their oil dependence after the events of 1973 (Yom Kippur War) and the shocks of 1980 (Islamic Revolution of Iran), which increased oil prices tenfold [1].

In 2016, oil trading represented a turnover of about $ 300 billion a day. The US and European countries import 22 million barrels annually. in a day. It is a necessary resource for the economy, which is not supplanted by renewable energy sources, which remain in the minority (about 2.7% of the world's energy) [1].

The current oil market reflects two main development trends. First, the rapid growth in oil demand in the eastern states. Secondly, the OPEC states are intensively developing the oil refining industry. Saudi Arabia is leading in this direction, creating the latest methods of oil refining, thus increasing its own reserves.

Since 2012, oil reserves in the world have grown by 8% and amounted to 236 billion tons. Crude oil production increased by a record 117 million tons in a decade. It is important to note that the total world explored oil reserves, even if there are significant deviations in

estimates for individual countries, as a whole, over the past three decades, have a steady upward trend. Table 1 shows the countries with the largest oil reserves as of 2018.

Table №1: Countries with the largest oil reserves as of 2018

№	Countries	Reserves billion barrels
1	Venezuela	300,9
2	Saudi Arabia	266,5
3	Canada	169,8
4	Iran	158,4
5	Iraq	142,5
6	Kuwait	101,5
7	UAE	97,8
8	Russia	80
9	Libya	48,3
10	US	35,2
11	Nigeria	37,1
12	Kazakhstan	30
13	China	25,6
14	Qatar	25,2
15	Brazil	12,9
16	Algeria	12,2
17/18	Angola	8,2
17/18	Ecuador	8,2
19	Azerbaijan	7
20	Norway	6,6
21	Oman	5,3
22	India	4,6
23	South Sudan	5
24/25	Vietnam	4,4
24/25	Egypt	4,4
26	Malaysia	3,6
27	Indonesia	3,2
28	Yemen	3
29	UK	2,6

Source: BP Statistical Review of World Energy 2018

Thus, taking into account the available estimates, at the current level of oil production, its world geological reserves will be enough for at least 42 years, including in Saudi Arabia - for 83 years, Iran - 69 years, Venezuela - 58, Libya - 56, Kazakhstan - 47, Russia - 22, China - 21, Algeria - 19, USA - 10, Norway - 9, Indonesia - 9 and in the UK - 5 years.

There are different points of view regarding the long-term prospects for the development of the world oil-extracting industry in connection with its provision with natural reserves.

There are also radical assumptions that it will significantly lose its position already in the first third of the 21st century and, in general, the current century will be a century of gas and coal. Indeed, the world's geological reserves and predicted gas resources significantly exceed the oil resource potential. [2]

However, the specific features of the use, in particular of coal, from the standpoint of environmental problems, as you know, significantly narrow the scope of its application.

Global fuel consumption has increased in recent decades, in part due to population growth, increased urbanization, and accelerated economic development in highly populated countries such as China and India. Population growth in industrialized cities consumes more energy and requires more petroleum products. Daily global demand for crude oil is growing steadily - from 95 million barrels in 2015 to 110.3 million by 2035 [3].

If the demand for oil exceeds the supply of the industry, it is likely that prices will rise. This happened at the beginning of the 21st century when economic growth increased the demand for energy. Oil price reached its all-time high in 2014 at $ 115 per barrel. In 2018, prices fell by almost half to $ 59.7 per barrel.

All countries of the world, without exception, take part in export-import operations with oil. Through the channels of international trade, flows within 50% of the world's oil. It accounts for more than 20% of the total export price of all developing countries.

Figure № 1: Ten leading countries in oil imports
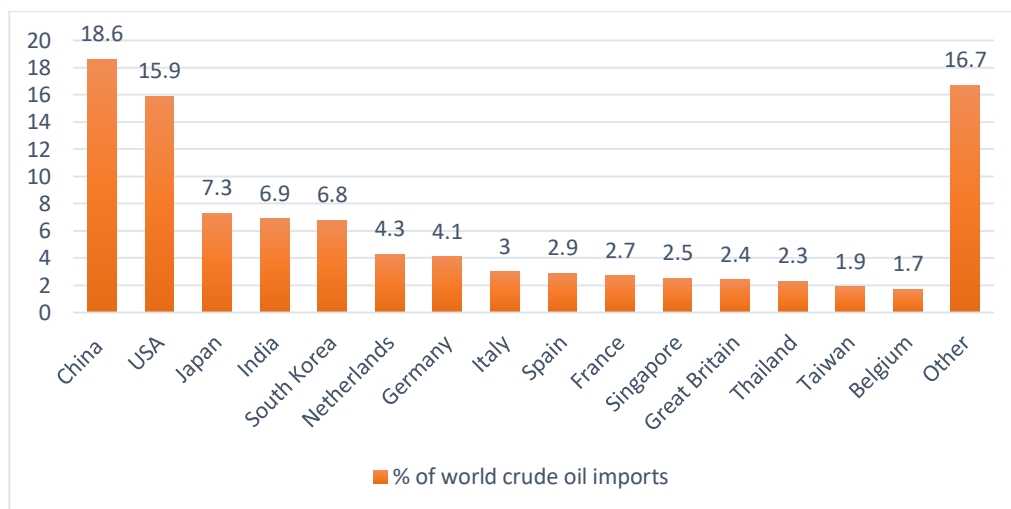
Source: Total Petroleum and Other Liquids Production - 2017 [Electronic resource] // Official site of the US Energy information Administration. - URL: https://www.eia.gov/beta/international/?topL=imp

Many countries are highly dependent on oil imports, which can lead to an unstable situation in the country if supplies are delayed.

Oil is so closely linked to industrial development and raising living standards in a country, no government can be indifferent to the oil industry, regardless of the role of local production. Producer countries rely on financing their economies and developing their oil production activities, which provide them with oil exports. On the contrary, consumer countries seek to reduce their dependence on producing countries by diversifying their supplies to ensure a certain level of safety and developing new energy substitutes.

In addition, the globalization of the oil industry continues to grow with the expansion of company spheres and the internationalization of national companies.

Innovation, and above all technological innovation, is a key competitiveness factor in overcoming depletion of stocks, meeting growing demand and meeting growing environmental challenges.

The exploitation of oil is a source of wealth and economic success, which in general allows interested countries to diversify their activities in order to end the "oil era".

3.1.2 Impact of oil price fluctuations on economic development

Oil prices tend to fluctuate from day to day depending on various factors such as supply and demand, the global economy, environmental issues, wars, or other dynamics in buying or producing countries.

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On August 1, 2014, the price of a barrel of oil was $ 104.5. A year later, on August 31, 2015, the price was more than twice as low ($ 49.2 per barrel) [4]. The current price for a barrel of brent is $ 50.97. Figure 2 shows the change in oil prices from 2000 to the present. Therefore, the decline in oil prices has been traced for a long time, but what are the reasons and consequences?

Figure № 2: World oil price (Brent Crude Oil, WTI, Dubai Crude Oil)
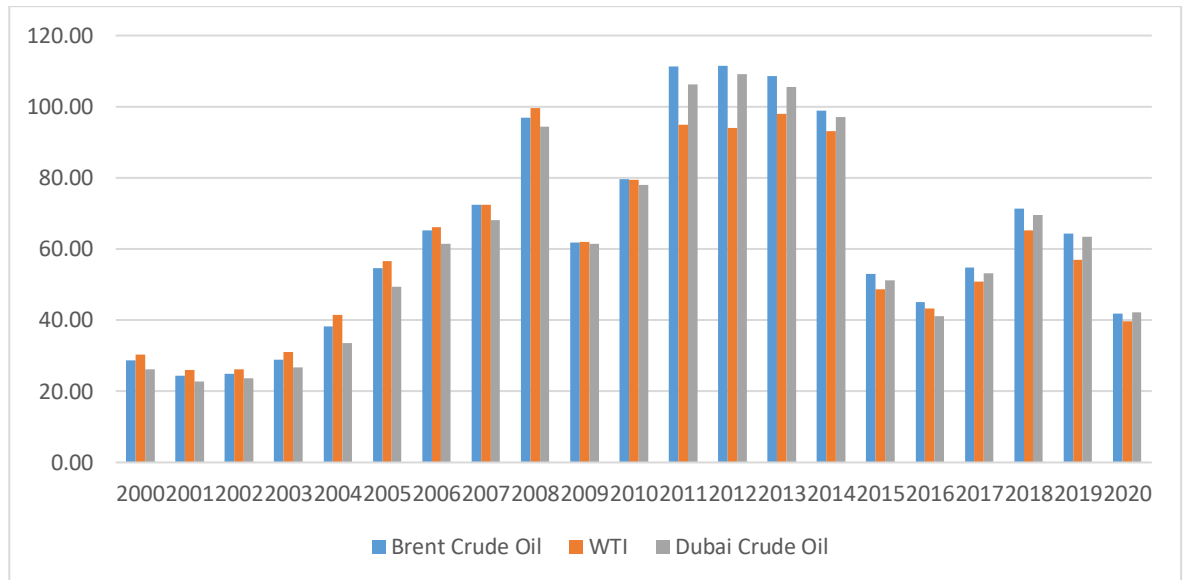
Source: Official website of Macrotrends - The Premier Research Platform for Long Term Investors - URL: https://www.macrotrends.net

For more than a century, oil has been one of the fundamental drivers of global economic growth, hence the alternative name "black gold". Oil is most widely used directly or indirectly in industrial production and transportation processes. Thus, fluctuations in its price have a noticeable impact on the economic situation. This influence is important because there is no other product for oil that can satisfy the same needs at a lower price. The main reason is the surplus of shale gas and oil in the United States. Consequently, the oil price indices and gas prices fell sharply. And the main producing countries are doing nothing to stop overproduction. In January 2014, the OPEC countries produced more than 32 million barrels per day, later production increased by another 280 thousand barrels. [5]

Next, we'll look at the reasons why oil and gas prices fell sharply in 2014. Factors driving down oil prices:

1) Increase in oil production

According to some estimates, in 2018, world oil production increased by 32.63 million barrels. per day, reaching a record 100 million barrels. in a day. This is due to an increase in production by OPEC member countries by 420,000 barrels to 32.63 million barrels per day, which made it possible to compensate for its decline in Iran and Venezuela [6].

2) The policy of the OPEC countries regarding new methods of oil production.

Another factor explaining the decline in oil prices is the policy of OPEC countries, especially Saudi Arabia, which has sought to bring unconventional oil producers from shale and tar sands to the market, whose production costs are high compared to conventional oil. In this strategy, demand will rise again relative to supply if shale oil production stops. By keeping production at the same level and refusing to reduce it, Saudi Arabia is seeking to make the exploitation of unconventional oil less profitable. OPEC's decision not to cut production as prices began to fall led to a surplus of oil on the global market, leading to a drop in prices.

There are huge reserves of shale in the USA, Canada, Russia, Venezuela, Europe, Africa and Asia. These reserves will be able to satisfy the needs of the whole world for years. This oil is extracted by hydraulic fracturing injecting water into shale sand. The production cost of shale oil is higher than that of conventional oil. For conventional oil, operating costs are around US $ 10 per barrel. Despite the decline in the number of shale oil wells in the United States, these products will withstand the crisis for geostrategic and economic reasons. Oil has never been in such widespread use, which cannot be said about oil.

In addition, shale oil production is potentially more responsive to price changes than oil production because wells are operated faster. Therefore, shale oil producers have the opportunity to adjust their products in a relatively short time. Therefore, if the fall in oil prices has already pushed some companies to stop using shale oil without having a decisive impact on the shale oil market, then the rise in prices can quickly revive the drilling of new wells.

A large amount of supply in relation to demand leads to the fact that oil prices decrease. As a result, low oil prices lead to stagnation in the economies of producing countries.

However, there is reason to believe that oil prices will be higher in the medium term (in the range of about $ 50 per barrel). This price does not match the needs of producer countries to fund their social peace policies with grants and assistants. Moreover, unless an acute political crisis interrupts oil supplies, it will be very difficult for the oil price to rise to

$ 100. As a result, oil-producing developing countries must rethink their business models [7].

Lower oil prices could weaken some oil exporting countries, especially those whose oil accounts for more than 10% of GDP, which averages 75% of their total exports. As a result, a decrease in oil prices will entail the need to reduce municipal costs and an increase in the joint tax burden on the economy, both by raising the rates of active taxes, for example, by increasing the tax base and the introduction of new taxes and fees. The growing socio-political tension will lead to the highest level of public spending of the budget, as well as the freezing of tax reforms. This will lead to an additional risk of postponing the deadlines for the conclusion of pressing issues of tax optimization in the oil branch and will provide an opportunity to increase the tax burden on oil production [8].

Another group of countries, including large oil producers such as Kuwait, the United Arab Emirates and Saudi Arabia, have significant financial reserves that have been protecting them from declining oil prices for some time. However, the larger the population of the country, the greater the economic risks.

Finally, for countries where oil is one of their significant, but not unique incomes, such as Kazakhstan, falling prices will lead to economic tension and lower GDP, but will not lead to bankruptcy of these countries.

Oil importing and consuming countries are one of the main beneficiaries of the fall in oil prices.

This applies to the entire euro area: a drop in oil prices will reduce the devaluation of the euro (export products will become cheaper and, therefore, more competitive), without an increase in imports, black gold is not too significant for the respective countries. Since the beginning of 2014, the oil price in euros has dropped by 7%. The key factor is the growth of the euro zone, estimated at 0.2 points. However, there are some disastrous consequences: given the amount of oil imported into Europe, a prolonged decline in prices could reduce inflation by 0.4 percentage points, which would mean extremely detrimental deflation to the continent's economic resilience [9].

Thus, we can conclude that oil prices have a very strong effect on the economies of both individual importing and exporting countries and the political situation in the world as a whole.

3.2 Modern trends in the development of oil production and trade in Kazakhstan

3.2.1. Current state and development prospects oil and gas sector of the Republic of Kazakhstan

The fuel and energy complex are of great importance for the economy of Kazakhstan. The republic belongs to a group of states possessing strategic hydrocarbon reserves and gradually increasing their influence on the formation of the EAEU energy market and the world oil market.

Kazakhstan, possessing significant reserves of hydrocarbon raw materials (about 3% of world reserves), is among the 15 leading countries in the world that produce this raw material along with the countries of the Middle East, Russia, Venezuela, China, Norway, Canada, Great Britain, Indonesia and Brazil.

Kashagan (9th place in the world) is a large oil and gas field in Kazakhstan. The total oil reserves are 38 billion barrels [10].

The oil and gas industry of the Republic of Kazakhstan is one of the main sectors of the country's economy. The current trend of active growth in this industry, along with the annual increase in oil production, contributes to the growth of Kazakhstan's attractiveness for foreign investment. Accordingly, attracting investment in the country's oil and gas industry will largely depend on the growth of world oil prices. It should be noted that a significant share (about 85%) of Kazakhstani oil is exported.

Due to the favorable investment climate, Kazakhstan is always open to foreign investment, which significantly speeds up the process of developing and launching new oil and gas fields.

The achievements of the country's oil and gas industry and the effective use of hydrocarbon reserves by the state also have a positive impact on the social and economic development of Kazakhstan. Large enterprises of the oil and gas industry: «Разведка Добыча "КазМунайГаз", «Мангистаумунайгаз» JSC, «Каражанбасмунай» JSC, «ПетроКазахстан Кумколь Ресорсиз»JSC and others.

The dynamics of GDP growth in Kazakhstan can be divided into three separate periods:

- practically zero growth from 1990 to 1999;

- the period from 2000 to 2014, when the positive dynamics of oil prices, investment inflow and production growth contributed to the annual increase in Kazakhstan's GDP by an average of 7-8% (except for the period of the global crisis in 2007-2009);

- the period 2015–2017, characterized by a steady and sharp drop in oil prices, a decrease in production and investment in the sector.

Note that from 2000 to 2004, despite rather low oil prices, the inflow of foreign investment in the oil and gas industry (gross direct investment in the sector doubled over 4 years) ensured a rapid increase in oil production in the country and an increase in export supplies.

The inflow of foreign investment in the following years increased (exploration), and the growth of oil production and the economy stabilized. Following the oil price quotations in 2008-2009, the country's economy slowed sharply. Thus, during the entire period of Kazakhstan's independence, the oil and gas sector was the main catalyst for active economic growth. The factors behind the sector's growth were price, direct investment and growth in oil production. Other sectors of the economy were unable to provide such strong and sustainable GDP growth.

In 2013-2017, oil production in Kazakhstan was approximately 80.2 million tons. Gas production in 2016 was recorded as stable, the decline was only 1%, from 22 to 21 million tons.

On December 10, 2016, at the OPEC meeting in Vienna, Kazakhstan announced a freeze in production in the first half of 2017 at 1.7 million barrels per day.

In the long-term dynamics, 2016 continued the downward trend in crude oil production in physical terms - minus 1.4% versus 2015.

At the same time, in value terms, on the contrary, after the decline in 2015, there was a rather optimistic level of growth - immediately + 24.4% per year [11].

According to the results of 2016, the sale of crude oil in the domestic market increased - plus 3.4% per year, to 4.5 million tons (this is 6.9% of the total resources in the sector).

Exports, on the contrary, slightly decreased (-2.1% by 2015, to 61.1 million tons, which is 93.1% of the total volume of use).

The decrease in exports of crude oil and oil products in 2016 by 2% in physical terms led to a decrease in cash (in USD) immediately by 27.6% [12].

For the Kazakhstani economy, which is extremely dependent on the oil industry due to the fact that about 80% of the produced oil is exported, the current crisis has certainly

become a difficult test. In addition to the forced reduction in oil production, the spread of Covid-19 imposes restrictions on the activities of oil companies, which has already led to a reduction in investment and a decrease in employment in the industry.

In the past two years, oil production in Kazakhstan has exceeded 90 million tons annually. Until that time, oil production had stagnated for a long time - since 2010, annual production has been on average about 80 million tons. The situation changed radically after the launch of Kashagan in autumn 2016, which allowed to increase production to current levels. At the same time, declining oil prices and Kazakhstan's participation in the OPEC + agreement to limit production hinder the ability to further expand oil production. In addition, scheduled repairs are scheduled at Tengiz and Karachaganak in the second half of 2020, which will lead to a decrease in oil production. As a result, this year the Energy Ministry assumes that oil production will decrease by about 7% YoY to 84.5 million tons.

Figure № 3: Oil production and export of Kazakhstan
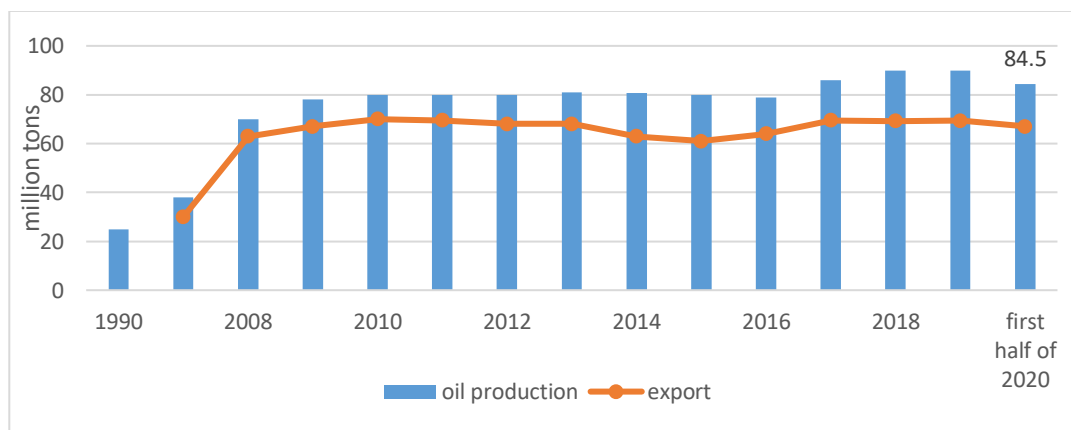
Source: Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan
https://stat.gov.kz/

Oil exports from Kazakhstan since 2017 have been at approximately 70 million tons per year. In 2019, oil exports brought the country $ 33.6 billion, with a moderate decline from $ 37.8 billion in 2018. The share of oil exports in the country's total exports is approximately 70%.

The volume of proceeds from oil exports from Kazakhstan for 6 months of 2020 decreased by $ 1.4 billion or 8.5% yoy to $ 15.1 billion, in physical volume, 37.3 million tons of oil were exported (+ 7.8% yoy). At the same time, the estimated price (based on physical volumes and revenue received in monetary terms) was $ 55 per barrel, which is

15% lower than $ 65 per barrel in the same period of 2019, but significantly higher than the average market price of Brent oil at $ 42 per barrel. barrel in January-June 2020 ($ 66 in the corresponding period of 2019). At the same time, data on tax receipts to the National Fund show a decrease of 31% in January-June, while the tenge depreciated by about 7%. That is, there is a smaller drop in income from oil exports in comparison with the fixed receipts to the National Fund.

Based on the increased volumes of oil supplies, at their lower cost, the loss of income from hydrocarbon exports due to unfavorable conditions in the world oil market can be estimated at about $ 2.7 billion in the first half of 2020. Taking into account the fact that in the second half of the year the average oil price is expected to be at $ 40 per barrel, and the physical volumes of exports, according to the Ministry of Energy's forecast, will decrease to 67.5 million tons from 70 million tons in 2019, revenues from the export of "black gold" in the whole year can fall by about $ 10 billion, or 30%. By historical standards, such a drop is not unprecedented for the Kazakh oil industry: in 2009, oil export revenues fell by more than $ 17 billion, or 40% y / y, and in 2015, the drop in exports was even more dramatic - minus $ 27 billion or 50 % y / y.

Figure №4: Crude oil exports from Kazakhstan, in tons and $ billion (6 mnth 2020 / 6 mnth 2019)

Source: Ministry of Finance of the Republic of Kazakhstan http://www.minfin.gov.kz/irj/portal/anonymous
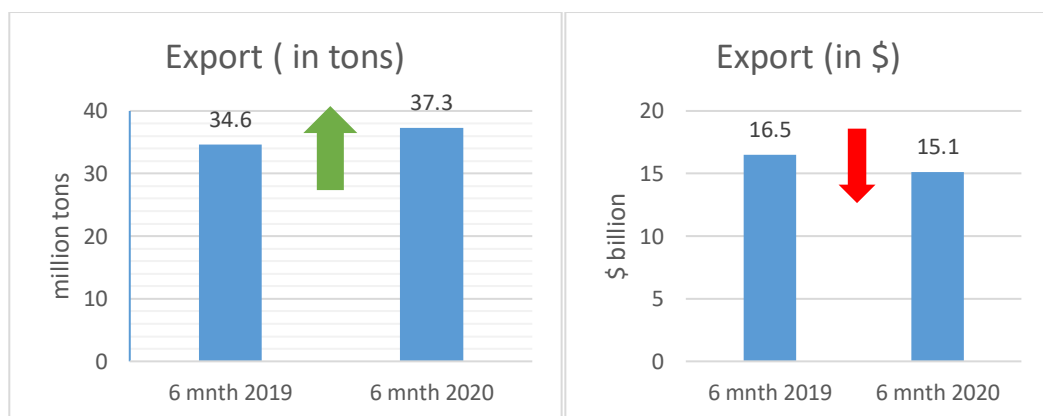
More than 60% of oil in Kazakhstan is produced at the three largest fields. In 2019, the largest of them - Tengiz - produced almost 30 million tons, or just over 600 thousand bbl / d. Kashagan is next in terms of production, where 14 million tons were produced - more than 300 thousand bbl / d. In third place in terms of oil production is Karachaganak with

11.6 million tons. Thus, Tengiz accounts for 33% of oil produced in Kazakhstan, Kashagan 16% and 12% Karachaganak. This year, oil production at the Kashagan field is scheduled to increase to 15.1 million tons from 14 million tons in 2019. Also, currently there is an active phase of expansion of oil production capacities in Tengiz, with an investment volume of more than $ 45 billion. It is planned that by 2023 oil production at Tengiz will increase by 10 million tons to 39 million tons. Accordingly, the total level of oil production in Kazakhstan may approach 100 million tons, and the share of the three largest fields may grow to 70% of all oil produced in the country [13].

Kazakhstan has been taking part in an agreement to cut oil production under OPEC + since 2016. According to the Ministry of Energy, oil production in June this year, excluding gas condensate, averaged 1.297 million bbl / d, while the country pledged to produce 1.319 million b / d. Thus, Kazakhstan in June exceeded its obligations, while in May the level of compliance with quotas was rather low. Under these conditions, Kazakhstan pledged to make up for the exceeded production volumes in July-September due to a larger reduction in the coming months. In the meantime, according to data for January-June, oil production increased by 1.4% yoy to 44.9 million tons [13].

Figure №5: Oil production in Kazakhstan (monthly)
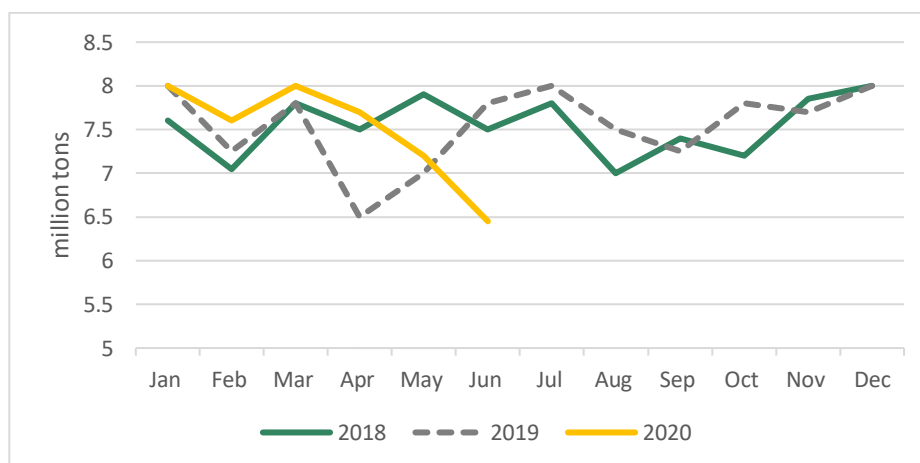
Source: Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan
https://stat.gov.kz/

In the first half of 2020, investments in oil and gas production in Kazakhstan dropped significantly by 13.3% YoY, while in first half of 2019 there was an increase of 30.8% YoY. The decline in investment was influenced by the spread of Covid-19. In recent years, the bulk of investments in the oil and gas sector has been carried out through the expansion of

capacities in Tengiz. At the same time, according to information published by the company - the operator of the project, it was forced to reduce the number of employees, continuing to implement only critical facilities.

As a result, if in February the growth of investments in oil production of the republic amounted to 27.2% y / y, then in March there was a slowdown to 5.7% y / y, and since April a gradual decline in the development of investments began to be noted. Thus, the spread of the coronavirus seriously slowed down the development of investments in hydrocarbon production, although production activities continued, but with certain restrictions.

3.2.2. Development of Foreign trade of crude oil in Kazakhstan

All the years of independence, the authorities of the Republic of Kazakhstan have been betting on the export of mineral raw materials, in which oil undoubtedly dominates. The Soviet potential, which ensured the diversification of the economy, has been exhausted. The republic practically lost its own production in many branches of the manufacturing industry. Attempts to carry out reindustrialization are unsuccessful: everything works only for the development of the oil sector and an increase in export supplies of raw materials.

Today the country exports about 80% of the oil produced, which is 2/3 of the revenues from foreign sales and forms almost three quarters of GDP. Such a structure of exports and a high share of oil revenues in the budget are the cause of macroeconomic difficulties that periodically sweep the country when oil prices fall. Thus, almost the entire Kazakhstani economy depends on oil exports, and this dependence cannot be reduced [14].

Oil production in the country is carried out by 97 subsoil users. The volume of production, which in 1992 amounted to 25.8 million tons, continues to grow and, according to the forecast of the Ministry of Energy of the Republic of Kazakhstan, by 2025 it will reach the level of 104 million tons / year. Three large oil and gas projects - Tengiz, Karachaganak and Kashagan, which account for more than half of the production volume, remain the drivers in the country's oil production [15].

Projects for further expansion and extension of production are underway at all three fields. At Kashagan, by 2024, under the further expansion project, production is expected to increase from 13 million to 16 million tons per year. At the same time, the high content of hydrogen sulfide in Kashagan oil makes it difficult to process it at European refineries. The plan for the future development of Karachaganak provides for the implementation of projects

to maintain the current level of production. At Tengiz, after 2022, the annual oil production will increase from the current 27 to 39 million tons [15].

According to the State Revenue Committee of the Ministry of National Economy of the Republic of Kazakhstan, in 2018, Kazakhstani oil was supplied to almost 30 countries of the world. Its traditional sales markets are Europe and Southeast Asia. The main buyers are concentrated in Europe, where Italy is the leader in terms of oil supplies - 21.03 million tons (30.2%), followed by the Netherlands - 9.52 million (13.7%), France - 6.66 million (9, 6%), Switzerland - 5.2 million (7.5%) [14].

However, the export map of Kazakhstani oil is changing. So, if in 2017 the share of Western consumers was 81%, then in 2018 they accounted for 75.4% of all sales. They were replaced by buyers from Asia, whose share increased from 11 to 17.7%. And this is understandable. The Asian direction is more promising in terms of the volume and structure of demand [16].

Oil shipment for export is carried out mainly by pipeline transport. Over 70% of the total export of Kazakhstani oil is transported by the Caspian Pipeline Consortium, through which raw materials from the fields of Western Kazakhstan are delivered to the Black Sea port of Novorossiysk (Russia), where they are poured into tankers. It is no coincidence that it is on the part of Kazakhstan that initiatives are constantly emerging to further increase the CPC's throughput capacity.

Plans to increase exports make one think about the development of transport infrastructure. However, in the foreseeable future, it is practically impossible to seriously change the export routes of Kazakhstani oil. Instead of diversifying the ways that ensure the output of extracted raw materials to the world market, it is more expedient for Kazakhstan to reorient itself to replacing its supplies with sales abroad of high-quality products of deep processing.

3.3 Macroeconomic indicators

3.3.1. Gross domestic product

The economic life of society consists of a variety of phenomena and processes. Their essence does not lie on the surface of the perception of phenomena. The explanation of many phenomena and processes should be sought in social production, in the economy.

The economy occupies a leading place in the system of social relations. It determines the content of political, legal, spiritual and other spheres of public life.

Macroeconomics examines the economic system at the level of the national economy.

The main macroeconomic indicator in the statistics of countries, as well as in international organizations, is GDP. It expresses the result of the functioning of the economy for a certain period of development, characterizes the finished product and the services produced.

Gross Domestic Product (GDP) is a central macroeconomic indicator used to determine the rate of development of production, characterize the structure of the national economy and many important macroeconomic proportions. It is widely used for international comparisons of the relative levels of economic development of different countries and regions of the world. Gross Domestic Product is a measure of the product produced, which is the value of the final goods and services produced. This means that the value of intermediate goods and services used in the production process (such as raw materials, fuels, energy, seeds, freight transport services, wholesale trade, commercial and financial services) is not included in GDP. Otherwise, the GDP would contain a repeated account [17].

Final products are goods and services that are purchased by consumers for end use and not for resale. Intermediate products are goods and services that are further processed or resold several times before reaching the final consumer.

In order to correctly calculate the total volume of production, it is necessary that all products and services produced in a given year be counted once, and no more. Most products go through several manufacturing steps before they enter the market. As a result, individual parts and components of most products are bought and sold multiple times. Thus, in order to avoid multiple counting of parts of products that are sold and resold, the GDP calculation takes into account only the market value of final products and excludes the value of intermediate products.

For example, grain grown in agriculture, before turning into the final product - bread, goes through four stages of processing: 1) collection, threshing and sorting of grain in agriculture; 2) cleaning, drying and storage on elevators; 3) grinding grain in mills; 4) baking bread at bakeries.

If, suppose, the price of grain produced in agriculture is n units, then during its processing and processing at three subsequent stages, this price is included three more times in the production costs at the elevator, the mill, the bakery, and ultimately is summed up four times when calculating the volume of production by all industries. However, the real value created at each stage of grain processing, covering the cost of production and income, appears only in the form of wages, depreciation and profit of that particular enterprise.

Therefore, to exclude multiple re-counting, GDP should act as the value of final goods and services and include only the value created (added) at each intermediate stage of processing.

Added value is the value created in the production process at a given enterprise and covering the enterprise's real contribution to the creation of the value of a specific product, i.e. wages, profits and depreciation of a particular enterprise. Therefore, the cost of consumed raw materials and materials that were purchased from suppliers, and in the creation of which the enterprise did not participate, is not included in the added value of the product produced by this enterprise [18].

In other words, value added is the gross output of the enterprise (or the market price of the output) minus the current material costs, but with the inclusion of depreciation deductions (since the fixed assets of the enterprise take part in creating the new value of the output).

GDP is produced by residents. All economic units (enterprises and households), regardless of their nationality and citizenship, which have a center of economic interest in the territory of a given country, are referred to as residents. This means that they are engaged in production activities or live in the economic territory of the country for a long time (at least a year). The economic territory of a country is a territory administered by the government of a given country, within which persons, goods and money can move freely. Unlike a geographic territory, it does not include territorial enclaves of other countries (embassies, military bases), but includes such enclaves of a given country located on the territory of other countries [19].

Gross Domestic Product is calculated using three methods:

Income Approach (GDP (Market Cost) = GDP (Factor Cost) + (Indirect Taxes – Subsidies)) (1)

Expenditure Approach (GDP (as per expenditure method) = C + I + G + (EX - IM) (2)

Output (Production) Approach (GDP (as per output method) = Real GDP (GDP at constant prices) – Taxes + Subsidies) (3)

The income approach includes income derived from the production of goods and services. With this approach, we calculate the income received from all factors of production in the economy. Factors of production are resources that go into the production of a final product or service. Thus, the factors of production for business are - Land, Labor, Capital and Management within the country's internal borders. In this approach, we calculate the income from each of these factors of production, which includes wages earned from labor, rent from land, capital income in the form of interest, and business profits earned by management. The sum of all these revenues is national income and is the way to calculate GDP.

Formula: Net National Income = Wages + Rent + Interest + Profits (4)

To make it gross, we need to do two adjustments – Add depreciation of capital & Add Net Foreign Factor Income. NFFI is (income earned by the rest of the world in the country – income earned by the country from the rest of the world)

GDP (Factor Cost) = Wages + Rent + Interest + Profits+ Depreciation + Net Foreign Factor Income (5)

In fact, this is the sum of the final income of all factors of production that affect business in the country before tax. Now, if we add taxes and subtract subsidies, we get GDP at market value.

GDP (Market Cost) = GDP (Factor Cost)+ (Indirect Taxes – Subsidies) (6)

The second approach is the opposite of the income approach, as it starts with money spent on goods and services. It measures the total costs incurred by all organizations for goods and services within a country's national borders.

Mathematically, **GDP (as per expenditure method) = C + I + G + (EX-IM)** (7)

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Where,

C: Consumption Expenditure, ie when consumers spend money to buy various goods and services. For example – food, gas bill, car etc.

I: Investment Expenditure, ie. when businesses spend money as they invest in their business activities. For eaxmple, buying land, machinery etc.

G: Government Expenditure, ie. when government spends money on various development activities and

(EX-IM): Exports minus Imports, that is, Net Exports. ie. we include the exports to other countries in calculation of GDP and subtract the imports from other countries to our country.

Output (Production) Approach measures the monetary or market value of all the goods and services produced within the borders of the country. In order to avoid a distorted measure of GDP due to price level changes, GDP at constant prices or Real GDP is computed [20].

GDP (as per output method) = Real GDP (GDP at constant prices) – Taxes + Subsidies (8)

The gross domestic product per capita (GDP per capita) is an indicator of the level of economic activity and the quality of life of the population in certain countries and regions for a certain period. GDP per capita is equal to the value of GDP divided by the number of inhabitants. The level and dynamics of this indicator indicate the level and dynamics of economic growth and development of the country, but this indicator reflects only the average value, therefore it does not allow taking into account inequality in incomes and welfare of the population.

Although GDP is a widely-used metric, there are other ways of measuring the economic growth of a country. While GDP measures the economic activity within the physical borders of a country (whether the producers are native to that country or foreign-owned entities), the gross national product (GNP) is a measurement of the overall production of persons or corporations native to a country, including those based abroad. GNP excludes domestic production by foreigners.

The valuation of the national product is impossible without taking into account the price level. In the current assessment of the national product, market prices prevailing at the time of assessment are used. However, it often becomes necessary to compare the volume

of the national product produced over different periods of time. In this case, market prices cannot be used, since, especially in an inflationary environment, they can differ significantly at the beginning and at the end of the time interval. Therefore, it is impossible to conclude on the basis of which the growth of the national product occurred: due to an increase in either the volume of production, or an increase in prices. Therefore, basic or comparable (constant) prices are used to conduct reliable macroeconomic analysis. For this purpose, special price indices are calculated - deflators of the gross national product.

Nominal macroeconomic indicators are indicators measured in current prices, real ones - in basic ones. Thus, nominal GDP is equal to the volume of final production of goods and services, measured in prices of the current year. Real GDP is the same quantity of goods and services measured at constant prices of the base year. If we divide the nominal GDP by the real one, we get the gross domestic product deflator. It measures the change in the average price level compared to the base year, i.e. the amount of inflation in the country for a given period.

3.3.2. Inflation

A very important concept in fundamental analysis is inflation in a single country (that is, the overflow of the money supply, and its depreciation, which inevitably entails an increase in prices, a fall in the exchange rate, etc.). If there is inflation, and its growth is very significant, and amounts to tens, if not hundreds, percent per year, then this clearly indicates a deplorable state of the economy in such a country, and low confidence in its currency. There can be a lot of reasons for the emergence of inflation - an inept attempt by the state to cover the budget deficit with additional emission, an excessive monopoly of certain corporations in certain areas (usually it concerns raw materials, and is directly related to options trading in the context of such assets), restriction of the market system by the state, decrease in the general level of production of goods (or services), etc. Inflation is characterized by a rise in prices corresponding to a fall in the standard of living; certain sectors of the economy may fall into complete decline because of it [21].

As a macroeconomic indicator, inflation clearly indicates the processes leading to instability in the state economy (and, the higher the annual inflation rate, the worse the economy is). This leads to many additional side economic processes - for example, the transfer of resources from one sector of the economy to another (heavy industry enterprises are closed, the number of jobs decreases, but the demand for imported goods and services is

growing, etc.). In general, inflation can be additionally divided into several types - demand (demand for a particular product significantly exceeds supply, production shortfall), higher production costs, balanced (typical for European countries - with it, prices for goods and services do not change in relation to one another), unbalanced, predictable, unpredictable, etc. Many Western economists are of the opinion that inflation is an integral and natural element of the economy, and it simply cannot be absent (in moderate amounts). On the other hand, the extremely successful experience of the Japanese economy proves that the state can, with good governance, eliminate inflation as a class, and regulate prices at various levels, maintaining a high standard of living [22].

3.3.3. Unemployment

One of the major economic problems is unemployment. It is characterized by the number of able-bodied citizens who are not employed at the current time but are actively looking for work. The totality of the employed and the unemployed constitutes the concept of labor power. The main indicator expressing the state of unemployment at a certain point in time is its rate. It is calculated as the ratio of the number of unemployed to the total labor force. The indicator is expressed as a percentage. Unemployment is a complex phenomenon with many options. The most common types of unemployment are:

Frictional, characterized by a job search period of 1-3 months. As a rule, it occurs when the population is almost fully employed [23].

Structural unemployment that occurs due to technological changes in production. It changes the demand for labor when an employee who has left one industry cannot get a job in another.

Seasonal unemployment, characterized by fluctuations in industries, depending on the season of release. That is, depending on the time interval, there is a change in the volume of demand, the need for a certain amount of labor.

Cyclical unemployment associated with economic downturns. It arises a decrease in demand for goods leads to a reduction in jobs, to reduce production. Equilibrium in the market is achieved with a decrease in wages, then part of the labor force is allocated, which can go to other sectors of the national economy [24].

Institutional, which arises in the absence of complete and transparent information about the state of the market for both households and entrepreneurs. It occurs when the labor market is ineffective.

Thus, unemployment characterizes the number of able-bodied citizens of the country who are actively looking for work. The causes of unemployment are different.

3.3.4. Foreign direct investment

Foreign direct investment is an investment of money and other material values in the country's economy by companies from other countries. This implies that such investments will not only be long-term but will also allow the investor to control the work of the recipient company - to directly influence management.

Naturally, this requires a certain - and considerable - share of ownership. The size of this decisive share is different in each country, but always exceeds 10% of the company's value. After this mark, the investor is able to effectively control the activities of the recipient company [25].

An important criterion for attracting foreign investment is the transfer of foreign technologies and other innovative external factors. The predominant form of foreign investment is direct investment, since it is considered the main source of capital investment. Foreign direct investment is not a burden as an external debt of the state, while ensuring the integration of the national economy into the world one. Direct investment is a factor in strengthening market relations. When making direct investments:

- Joint entrepreneurial activity is developing
- New industries and innovative types of production appear
- Reduced production cost
- Sales markets and export opportunities of enterprises are expanding.

The activities of foreign enterprises have a huge impact on the state of the domestic market, as it forces competing companies to produce and sell high quality goods for the international market [26].

For states with transformational economies and highly qualified employees, the presence of high-tech companies of an international level in the country helps to reduce the inclination and desire of skilled labor to emigrate to countries with higher earnings.

3.3.5. Interest rate of the Central Bank

One of the strongest indicators in the economy is the Central Bank's interest rate. It is necessary for the competent management of both domestic and foreign economic policy.

The Central Bank's interest rate is the percentage charged to commercial banks or other lending institutions for providing borrowed funds. The main functions of the refinancing rate are:

- Economic regulation.
- Income taxes on deposits.
- Calculation of fines to the employer for the expired payment of salaries to employees.
- Calculation of penalties for unpaid taxes and fees [27].

Only a certain commission of the Central Bank can set the refinancing rate. As a result, the percentage that ordinary citizens who have taken money from a commercial bank will pay directly depends on this indicator. Thus, it turns out that if the Central Bank increases the interest rate, then in order for the commercial bank to pay off the debt and go into profit, it must set the rate for the persons it serves even higher than the refinancing rate. In the event of a decrease in the interest rate, credit organizations also reduce interest on loans.

It is worth noting that if the rate rises, then there are 2 reasons for this:

Increasing the attractiveness of the national currency. As a result of the increase in the refinancing rate in the Forex market, the currency is growing. Banks are able to place money allocated by investors on deposits at a higher interest rate [28].

Reducing inflation in the country. Due to the interest rate, price increases are not allowed without increasing production.

But in addition to the positive aspects, the increase in the refinancing rate has a significant disadvantage: as a result of the increase in the interest rate, business lending is getting more and more expensive. As a result, organizations are downsized, and unemployment appears in the country. In addition, the amount of money in circulation is increasing.

When the interest rate goes down, the opposite effect occurs. It is easier for businesses to take loans, but inflation in the country is increasing and the currency is becoming unsightly for investors [29].

That is why in order to correctly determine the interest rate, the maximum collection of important information and competent planning are required.

3.3.6. External Debt

External public debt is funds borrowed to pay off budget deficits outside their own country: from other countries, foreign companies and financial institutions, funds, private banks, foreign individuals.

External borrowing occurs through the sale of government securities outside the country or by receiving funds directly. The amount of external debt consists of liabilities to development organizations, authorities of other countries, bank loans, and supplier loans [30].

Obtaining external loans helps to strengthen financial resources, increase demand for goods and services of its own production, if money is used for these purposes. Also, external revenues can be used to pay off previous loans and interest on them, pay for imports, finance budget expenditures and social payments.

However, debt payments and repayment of interest on servicing loans leads to a reduction in GDP in the part that could be directed to the country's economic development [31].

4 Practical Part

4.1 Brief retrospective analysis of the Kazakhstan's economy focusing on its macroeconomic indicators

The economy of the Republic of Kazakhstan is one of the fastest growing in the CIS. The observed growth was largely due to large foreign investors in the oil and gas industry, the expansion of which had a positive effect on other industries.

However, economic growth is still largely dependent on growth in oil and gas production in Kazakhstan, as well as the global market conditions for these products.

We are going to conduct a macroeconomic analysis of Kazakhstan for the period from 2000-2019, by such indicators as Gross domestic product, Inflation, Unemployment, Direct foreign investments, Interest rate of the Central Bank, External debt level.

4.1.1 Gross domestic product of Kazakhstan

Kazakhstan occupies approximately 50th place in the list of countries by the nominal value of gross domestic product ("GDP").

During 1999-2013, Kazakhstan's GDP in current prices increased by $ 219.8 billion (14.0 times) to $ 236.6 billion; the change occurred by $ 2.2 billion due to population growth by $ 2.0 million, and by $ 217.5 billion due to an increase in GDP per capita of $ 12,775.0. The average annual GDP growth in Kazakhstan was at the level of 15.7 billion dollars or 20.8%. The average annual GDP growth in Kazakhstan in constant prices is 7.9%. The share in the world increased by 0.25%. The share in Asia increased by 0.71% [32].

For the period 1999-2013 GDP per capita in Kazakhstan increased by $ 12,775.0 (12.4 times) to $ 13,898.0. The average annual growth of GDP per capita in current prices is $ 912.5 or 19.7%.

For 2013-2019 Kazakhstan's GDP in current prices decreased by $ 55.0 billion (by 23.2%) to $ 181.7 billion; the change occurred by $ 21.2 billion due to an increase in the population of $ 1.5 million, as well as by $ -76.2 billion due to a fall in GDP per capita by $ 4,105.0. The average annual GDP growth in Kazakhstan was at the level of -9.2 billion dollars or -4.3%. The average annual GDP growth in Kazakhstan in constant prices was 3.2%. The share in the world decreased by 0.098%. The share in Asia decreased by 0.35%.

For the period 2013-2019 GDP per capita in Kazakhstan increased by $ 4,105.0 (by 29.5%) to $ 9,793.0. The average annual growth of GDP per capita in current prices amounted to -684.2 dollars or -5.7% [32].

In connection with the raw material orientation and export orientation of the economy of Kazakhstan, its development is closely related to the situation on the commodity market, primarily oil and metals.

From 2000 to 2011, Kazakhstan's GDP showed rapid real growth at a double-digit level with short-term adjustments in 2008-2009 due to the impact of the global financial crisis. From 2012 to 2014, the country's growth rate stabilized at 4-6%. Such dynamics of growth rates is explained by a significant enlargement of the country's economy against the background of high prices for oil and metals.

In 2015-2016, there was a drop in GDP growth to 1.2 and 1.1%, respectively, which was due to the crisis of collapsed oil prices. At the same time, since 2017, Kazakhstan's economic growth indicators have been recovering - slightly above 4% [32].

Figure № 6: Historical dynamics of GDP in Kazakhstan

Source: The World Bank Group, https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=KZ
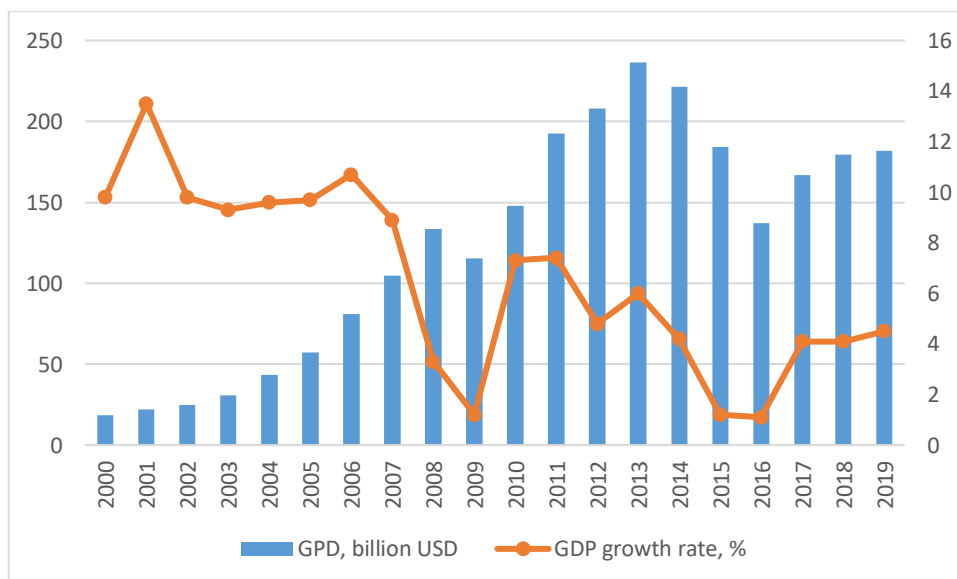
According to World Bank experts, 2020 has become the most difficult year for the economy of Kazakhstan over the past two decades. The pandemic and falling prices for Kazakhstan's main export commodity have led to much worse consequences than the crises of 2008 and 2015. For the first time since the early 2000s, the dynamics of GDP showed negative values - at the end of the year, minus 2.6%, according to the Ministry of National Economy [33].

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According to the forecasts of the World Bank experts, the final level of GDP decline over the past year in Kazakhstan will be 2.5%. This assessment is comparable to the economic scenarios voiced by other international development institutions. The Eurasian Development Bank predicts a fall in the economy of Kazakhstan by the end of 2020 by 2.5%, the International Monetary Fund - by 2.2%. The results, summed up by the specialists of the Ministry of National Economy of the Republic of Kazakhstan, showed that the republic's economy fell by 2.6% [33].

The World Bank report presents a basic scenario for economic development for 2021-2022, it is most likely provided that the pandemic is brought under control. The document says that this year the dynamics of GDP will change direction from negative to positive - up to + 2.5%. This is possible under the conditions of a gradual easing of restrictive measures, the beginning of vaccination of the population both in Kazakhstan and around the world. 2022 should be the year of the beginning of a slow recovery in economic growth rates - by December to 3.5% [33].

4.1.2 Inflation in Kazakhstan

According to analysts, the normal inflation rate should be in the range of 3 to 5% per year. To calculate the indicator, a set of goods and services is determined, which consists of 510 items. The state of prices is observed selectively among the trading enterprises and the service sector of various forms of ownership. The analysis includes the capital, all regional centers, some cities and regional centers [34].

Inflation in annual terms from 2001 to 2004 remained at a relatively stable level in the range of 6-7%, However, since 2002, there has been an increase in inflationary processes in the economy of Kazakhstan. At the end of 2005, inflation was at the level of 7.6%.

For three years, the actual inflation rate in Kazakhstan has been higher than the official forecast of the National Bank and the government. 2005 was no exception. According to the Statistics Agency of the Republic of Kazakhstan, inflation in December 2005 compared to December 2004 was 7.6%, while the National Bank of the republic predicted annual inflation at 5.2-6.9%, and the Ministry of Economy and Budget planning in the corridor 5-7% [35].

The main reasons for inflation to go beyond the forecast level are external factors - high world prices for oil and metals (the basis of Kazakhstan's exports), as well as internal - social payments from the budget aimed at increasing wages, pensions, scholarships, benefits, rising prices for energy carriers, services and fruits and vegetables.

According to the National Bank of the Republic of Kazakhstan, in 2006 there was a high level of aggregate demand, which was formed as a result of an increase in the incomes of the population, enterprises, the state, outstripping the growth of productivity in the economy, as well as an active budget policy that increased the impact on inflation of volatile factors not related in the short term to monetary policy of the National Bank.

The increase in inflationary pressure in 2008 was caused not so much by the influence of fundamental factors, which have been in effect for a number of years, but by the impact of external factors of a shock nature.

The fundamental factors of inflation in 2008 were the inflow of foreign exchange, high growth rates of aggregate demand, an increase in money supply in 2007, low labor productivity, and insufficient competition in certain markets for goods and services.

At the end of 2008, inflation amounted to 18.8% (December 2007 versus December 2006), which is 10.4 percentage points higher than in 2006. Food products became more expensive by 26.6%, non-food products - by 10.5%, paid services - by 15.4% [35].

Inflation in the Republic of Kazakhstan in 2017 was 7.1%. At the same time, prices for food products increased by 6.5%, non-food products went up by 8.9%, services on a paid basis - by 5.9%.

Inflation in Kazakhstan in 2018 decreased and amounted to 5.3%. During this year, prices for food products increased by 5.1%, non-food products - by 6.4%, for services - 4.5%. This is slightly less than in 2017. According to experts, the main reason for the slowdown in inflation is the decline in world oil prices [35].

A characteristic feature of inflation in Kazakhstan is a stable, fairly high inflation rate, despite the efforts of the authorities.

This testifies, firstly, to the presence of certain permanently acting factors affecting the nature of monetary relations and, secondly, to the limitations and inefficiency of the existing methods of managing these relations.

The main reason for the ineffectiveness of methods of regulating inflation is the imbalance of the economy.

A feature of its structure is the weak development of consumer production both during the period of planned economy and now the raw materials orientation of the economy.

Income from the export of raw materials creates additional supply in the foreign exchange market, which in turn leads to the strengthening of the tenge. If the National Bank tries to restrain the increase in the real exchange rate of the tenge by intervening in the foreign

exchange market, then the money supply expands and inflation rises. Large income from the export of minerals weakens and postpones the implementation of the necessary structural reforms in the economy in the country. Therefore, the reform of the economy, aimed at deep processing of raw materials capable of absorbing the country's monetary resources efficiently and the development of the financial market is of particular relevance.

The raw materials orientation of the country's economy can exacerbate macroeconomic imbalances in the country, but at the same time accelerate the creation of a full-fledged infrastructure for a market economy, provided that export revenues are effectively managed.

At the same time, the efforts of the state should be aimed at a justified redistribution of export revenues in order to create the preconditions for the economic recovery of the non-resource sector, since the limited nature of natural resources determines the temporary nature of export revenues.

Therefore, economic policy in the context of a large inflow should be directed mainly not at current consumption, but at diversifying domestic production, creating and expanding commodity and financial expansion of markets, and developing health care, science and education. We must not forget that one of the biggest shortcomings of the Soviet economic system is the excessive emphasis on the development of the raw materials sector.

4.1.3 Unemployment in Kazakhstan

According to the Statistics Committee of the Ministry of National Economy of the Republic of Kazakhstan in 2019, the employed population in the Republic of Kazakhstan was 8.8 million people, the unemployed population of the republic was 440 thousand people [35].

The natural unemployment rate includes frictional and structural unemployment. This type is not associated with the dynamics of the country's economic growth and is due to natural reasons such as staff turnover, migration, demographic reasons. Seasonal unemployment, meanwhile, is attributed to seasonal fluctuations in the output of certain industries.

About the labor market in Kazakhstan, the country experiences various types of unemployment such as natural and cyclical unemployment. There are factors such as the mismatch in demand in the labor market by specialty or qualifications, the applicant has no

opportunity to find a job. Also, in the construction and agricultural sectors, seasonal demand is noticeable.

As a result, the unemployment rate in Kazakhstan in 2019 was 4.8%. Analysis of dynamic indicators demonstrates the annual decline in the unemployment rate in the country. In general, if we consider the period from 2000 to 2019, then the jump in the unemployment rate was recorded in 2000 (12.8%). Further, there is a subsequent decrease in this indicator and in 2007 it reaches the level of 7.3%. In 2008-2009, the stagnation of the relative number of unemployed in Kazakhstan at the level of 6.6% is noted. Thus, over the past 20 years, an increase in the unemployment rate has not been observed, except for 2015, when the unemployment rate rose to 5.1% (in 2014 it was 5%) [35].

Figure № 7. Unemployment rate of Kazakhstan, %, 2000-2019
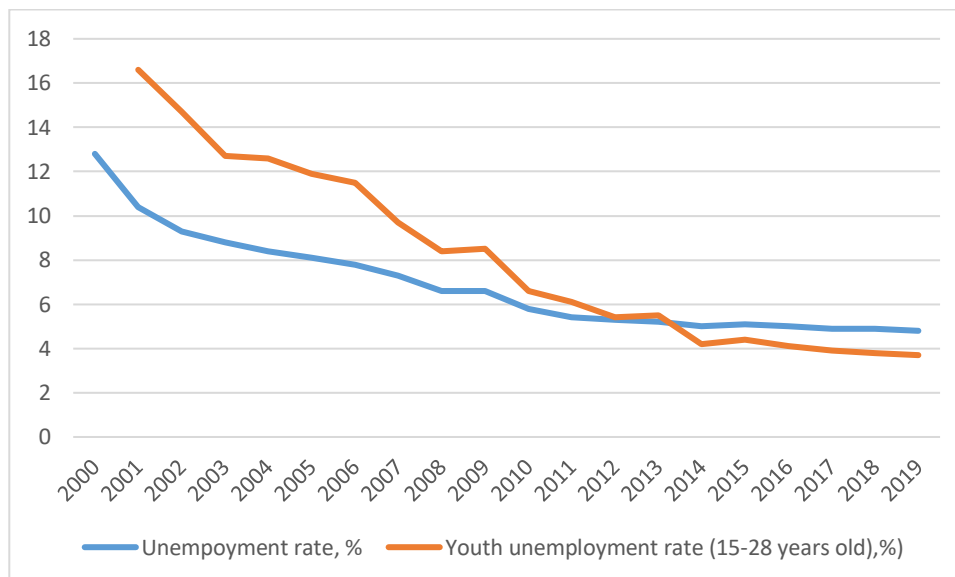
By territorial affiliation, the bulk of the unemployed population (58%) lives in the cities of Kazakhstan, the rest (42%) - in rural areas. We also note that the urban labor force has increased by 742.3 thousand people since 2010 and amounted to 57% of the total economically active population. At the same time, the rural labor force for 8 years decreased by 183.6 thousand people, or 4.5% [36]. In other words, the processes of urbanization in Kazakhstan are accompanied by both an increase in the labor force in cities due to the increasing flows of rural-urban migration, and an increase in the total number of unemployed in the structure of the urban population.

In terms of gender, the share of men in the number of unemployed in 2018 was 45% (198.5 thousand people), women - 55% (243.1 thousand people).

Moreover, the share of young people aged 15-28 was 19% (81.9 thousand people). The level of youth unemployment at the age of 15-28 has developed at - 3.8% [37].

However, the largest number of unemployed prevails at the age of 29-34, accounting for 28% (122.9 thousand) of the total number of unemployed.

Among the unemployed population, 71% have education (higher educational institution, technical and vocational education), 26% secondary and 2.2% incomplete higher education. Moreover, 26% have higher education, 2.2% incomplete higher education, 45% secondary and primary vocational education, 27% secondary education [35].

Among the most important reasons for unemployment, the most common in Kazakhstan are the following:

- dismissal of their own accord (23%);
- there is no opportunity to find a job (22.5%);
- for family reasons (11%).

As a result of the above, the main reasons for youth unemployment in the labor market of Kazakhstan should be noted: the absence of a system for allocating graduates of higher educational institutions to jobs, in accordance with the specialty received and the difference between the required specialties in the labor market and the specialties of graduates. To solve youth unemployment, international experts ardently argue that with the requirements of digitalization, it is necessary to develop remote work, and for developing countries, small and medium-sized businesses are the main source. In this regard, it is necessary to pay attention to the revitalization of the private sector. Also need assistance to travel to those territories where there is a shortage of labor, or vice versa.

4.1.4 Interest rate of the Central Bank of Kazakhstan

The base rate is the main instrument of the National Bank's monetary policy, which allows regulating nominal interbank interest rates in the money market. By setting the level of the base rate, the National Bank determines the target value of the target interbank short-term money market rate to achieve the goal of ensuring price stability in the medium term.

A change in the base rate affects the inflation rate through money market interest rates and the exchange rate. For example, an increase in the base rate leads to an increase in money

market interest rates, then to an increase in the cost of funds in the financial market, which, in turn, affects the decision-making of the population and enterprises regarding consumption and savings. Reducing consumption and increasing savings have a downward impact on inflation. In addition, an increase in the base rate contributes to the strengthening of the national currency, which, in turn, has a downward effect on inflation.

At the same time, a change in the base rate affects inflation in the medium term, while in the short term its impact is limited.

The dynamics of rate changes is displayed on the chart.

Figure № 8. Dynamics of changes in the interest rate of the Central Bank of Kazakhstan (weighted average for the year), 2000-2019
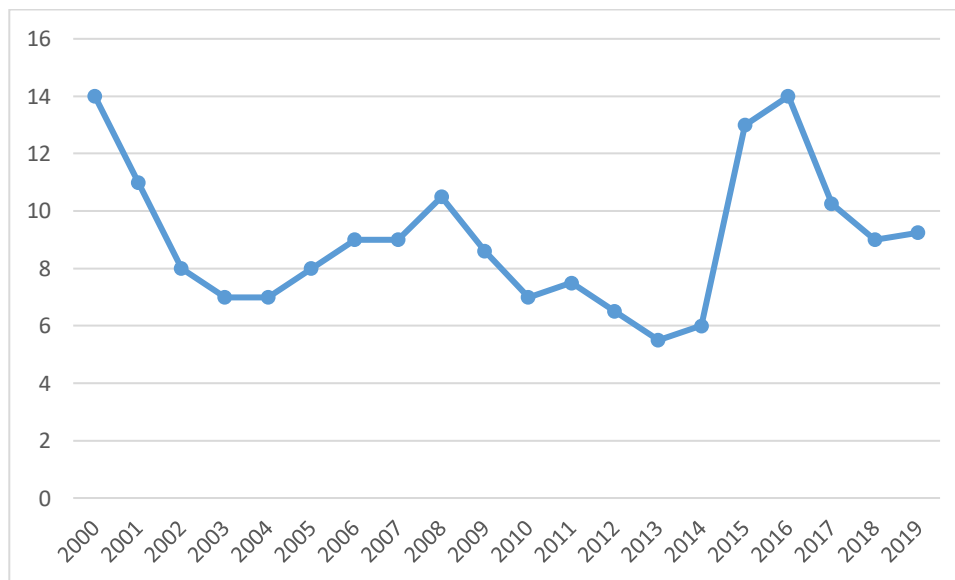
Source: National Bank of Kazakhstan, https://nationalbank.kz/ru/page/o-nacionalnom-banke

By the end of 2020, the National Bank set the base rate at 9.0% per annum while maintaining the interest rate corridor +/- 1.5 percentage points. Accordingly, the rate on standing access operations to provide liquidity will be 10.50% and on standing access operations to withdraw liquidity - 7.50% [38].

The decision is due to fundamental instability in the oil market, high and weakly anchored inflationary expectations, while still remaining uncertainty associated with the epidemiological situation in the country and the world, as well as with the timing of mass vaccination. Anchoring inflation expectations is the basis for achieving the inflation target

in 2021-2022, in this regard, the current level of the base rate will allow to achieve the inflation target of 4-6% by the end of 2021 [38].

The National Bank continuously monitors the external and internal situation and, if necessary, will flexibly adjust its monetary policy. The National Bank has all the necessary capabilities and tools to ensure financial stability and is ready to make adequate decisions in the event of a significant deterioration in the global economy.

4.1.5 External debt level of Kazakhstan

Attraction and use of foreign loans are one of the most important directions of the monetary and foreign exchange policy of the state. Considering the importance of external borrowing for the country's economy, one should take into account both their positive and negative impact. On the one hand, external borrowing at a certain stage contributes to the development of the country's economy, the expansion of international trade, the introduction of new technologies and industries, and is a non-inflationary source of financing the budget deficit. On the other hand, when the external debt is due for repayment, the investment opportunities of the state are limited due to the need to accumulate resources to repay the debt.

One of the pressing problems for Kazakhstan is the presence of a significant external debt, which has a direct impact on both the country's economic growth rates and all areas of government policy. Research has shown that there was no systematic approach to external debt management in Kazakhstan. The lack of an effective system for monitoring external borrowings and proper control over their placement inside the country has created a threat to the national economic security of the Republic of Kazakhstan. After the global financial crisis, Kazakhstan revised its strategy to attract external borrowings. As a result, thanks to the anti-crisis measures taken in Kazakhstan and the high world prices for mineral resources, established in this period, it was possible to somewhat reduce the growth rate of external debt. However, the structure of the republic's external debt is still not optimal for the purposes of its effective management. In addition, huge resources are diverted to servicing the external debt, which exceed the costs of most large items of the republican budget, which significantly reduces the investment potential and opportunities for the country's economic development.

An important indicator in the system of indicators of the country's external debt is the size of the external debt. The dynamics of growth in the volume of external debt of Kazakhstan, calculated according to the World Bank, is presented in Figure 9.

Figure № 9. External debt level of Kazakhstan, 2000-2019
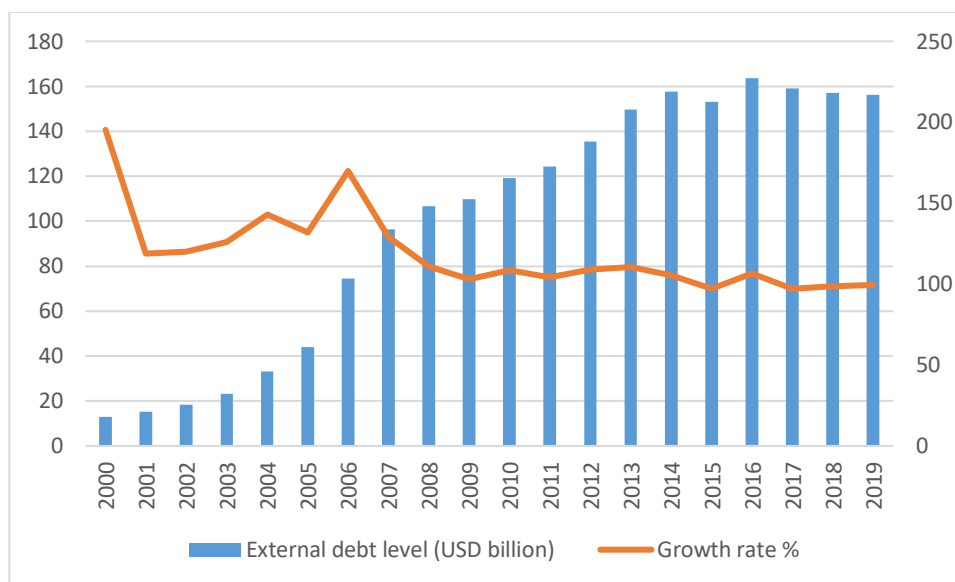
For the period 2000-2019 there was a significant increase in the volume of external debt. The highest growth rates of this indicator are observed: in 2004 - 143%; in 2006 - 169.7% [39].

Kazakhstan's external debt as of October 1, 2020 amounted to $ 160.9 billion or 90.7% of GDP. Public external debt is only 8.2% of the country's debt, or $ 13.2 billion [38].

The specified volume of external debt is not subject to payment at the expense of the budget or the population, since about 80% of the external debt falls on the liabilities of private organizations, for which neither the state nor ordinary citizens are responsible.

The external debt of the quasi-public sector - 12.5% (or $ 20.1 billion) totaled 18.8% of GDP, which, according to international practice, refers to a safe level [38].

As of October 1, 2020, direct and contingent external liabilities of Kazakhstan amounted to $ 33.3 billion, having decreased over the past 3 years by $ 6.2 billion or 15.7% due to early repayment and restructuring of the external debt of organizations of the quasi-public sector [38].

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The largest part in the structure of the country's external debt is occupied by inter-company debt of the private sector ($ 101.3 billion or 62.9%), most of which are three large projects with foreign participation - Kashagan, Tengizchevroil and Karachanak. To implement such projects, foreign investors finance their group companies registered in Kazakhstan. According to international methodology, such investments are also considered the country's external debt [40].

The external debt of Kazakhstan is under constant monitoring and control by the government and the National Bank. The Concept of the New Budgetary Policy and the Concept of Formation and Use of the National Fund's resources established indicators that determine the debt sustainability of the country:

a) the ratio of public and quasi-public debt (external and internal) - should not exceed 60% of GDP (46.5% as of October 1, 2020);

b) the ratio of the country's external debt - should not exceed 100% of GDP (90.7% as of October 1, 2020);

c) the volume of the external debt of the government and the external debt of the subjects of the quasi-public sector - should not exceed the total amount of foreign exchange assets of the National Fund (59.1% as of October 1, 2020) [38].

Compliance with these indicators is ensured by the annual establishment by the Ministry of Finance (for public debt) and a special interdepartmental commission (for quasi-public debt) of permissible amounts (limits) of external borrowing.

It should be remembered that external debt is not necessarily a burden on the economy and population of a country. External debt, if there is an opportunity to rationally repay it (stable income level, availability of liquid assets), serves as an additional source of investment.

The attraction of external financing ensures an inflow of new technologies, creates jobs, provides direct taxes, promotes integration into global production chains and the expansion of sales markets.

4.1.6 Oil and gas production in Kazakhstan

The oil and gas sector, as one of the leading branches of industrial production, is the basis for the development of the economy and largely determines the economic independence of the country. Since the first years of independence of the Republic of

Kazakhstan, the oil and gas sector has become the locomotive that has played and continues to play a crucial role in the formation and development of the state's economy. Kazakhstan is in the top ten of the global ranking in terms of hydrocarbon reserves and is one of the largest suppliers of crude oil in the Central Asian region.

In terms of proven oil reserves, Kazakhstan has 3% of the world's oil reserves. Oil and gas regions occupy 62% of the republic's area and have more than 250 oil fields [41].

In 2018, after the completion of the modernization of the country's largest oil refineries, the volume of oil and gas condensate production reached a record figure of 90.4 million tons (an increase in comparison with 2017 - 33%).

In 2019, despite carrying out major repairs at large projects (Tengiz, Karachaganak, Kashagan), oil production amounted to 90.5 million tons [41].

Figure № 10. Volume of oil and gas production of Kazakhstan, 2000-2019, million tons

Source: The World Bank. https://data.worldbank.org
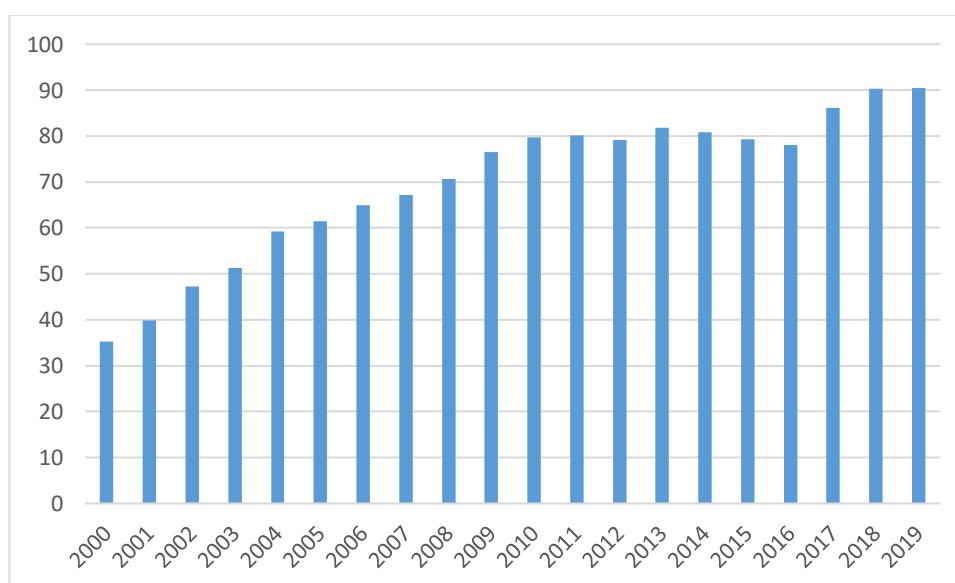
As we can see, for 2000-2019 oil and gas condensate production increased 2.5 times.

Crude oil production in 2018 in physical terms amounted to 77.5 million tons, in 2017 - 72.9 million tons, in 2016 - 65.6 million tons. Crude oil production in 2018 increased by 16.4% compared to 2016 (by 11.9 million tons) [42].

The increase in oil production is mainly associated with stable growth at the Kashagan (2018 - 13.2 million tons), Tengiz (2018 - 28.6 million tons) and Karachaganak (2018 - 11

million tons) fields. The total indicators of these three assets at the end of 2018 alone accounted for 58% of the total oil production in the Republic of Kazakhstan.

According to the Committee on Statistics of the Republic of Kazakhstan, the volume of natural gas production 52.9 in 2018 in physical terms amounted to 55.5 billion m3, in 2017 - 52.9 billion m3, in 2016 - 46.7 billion m3. Natural gas production in 2016–2018 increased by 18.8% [42].

According to the data of the Committee on Statistics of the Republic of Kazakhstan for 6 months of 2019, the following amount of the main industrial products was produced in the oil and gas industry in kind:

- production of crude oil, including oil obtained from bituminous minerals - 38.0 million tons;
- gas condensate - 6.3 million tons;
- natural gas in liquid or gaseous state - 28.1 billion cubic meters.

As of January 1, 2019, the share of oil and natural gas production in the republican volume of industrial production was 44.3% [42].

The development of the oil and gas industry has provided strong support to the national economy - at the end of the eleven months of 2019, the industry's share in GDP was about 17%, which in turn made it possible to stimulate economic growth to 4.4% [41].

Existing trends indicate that the oil and gas industry of Kazakhstan continues to be in the zone of active growth, while maintaining its high investment attractiveness. According to the National Bank of the Republic of Kazakhstan, for the first quarter of 2019, the net inflow of direct investment in the oil and gas industry of the Republic of Kazakhstan amounted to USD 1,888.2 million, or 77.8% of the total direct investment in Kazakhstan. In 2016–2018, the inflow of investments into the oil and gas industry of the Republic of Kazakhstan increased by 95.9% (by USD 2,012.2 million) [43].

According to the Committee on Statistics of the Republic of Kazakhstan, as of January 1, 2019, the export of goods of the Republic of Kazakhstan amounted to 5.3 billion US dollars, which is 28.7% more compared to the same period in 2018. At the same time, the increase in exports over the specified period was mainly provided by an increase in oil exports by 40.5% (by USD 962.1 million) and natural gas - by 2.8 times (by USD 258.3 million) [42].

Figure № 11. Main partners (importers) of crude oil and oil products of the Republic of Kazakhstan in January 2019 (in%)
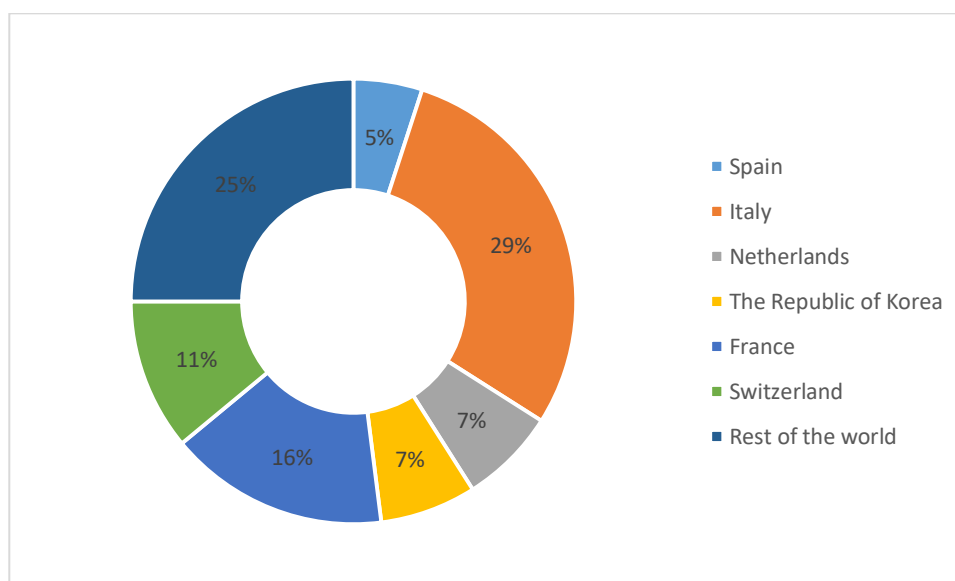
Source: Committee on Statistics of the Republic of Kazakhstan, https://stat.gov.kz/

According to the Committee on Statistics of the Republic of Kazakhstan, the export of crude oil and petroleum products in January 2019 in physical terms amounted to 6.4 million tons. At the same time, the main buyers of Kazakh oil are Italy, which accounts for 29% (1.8 million tons), France - 16% (1.0 million tons) and Switzerland - 11% (718 thousand tons) [42].

The price of oil around the world changes daily. The main factors in the oil price change are the current supply and demand, the budget of the leading oil-exporting countries, and the political factor.

One of the main factors shaping the global demand for oil and gas is the growth of the world economy, and in the medium term oil will remain the most important source of energy, therefore, a drop in demand for oil is not expected. The economy of Kazakhstan today has a raw material orientation, and, in the near future, the situation will not change significantly.

4.2   Regression analysis

The main goal of using econometric analysis in this paper is to determine whether there is an interrelation or causality that exist among the Kazakhstan's Volume of oil and gas production, GDP, Inflation %, Unemployment %, Direct foreign investments, Interest rate of the Central Bank, External debt level, and if it does, to be able to gauge the degree that these variables affect the Volume of oil and gas production of Kazakhstan.

It follows from this that in order to perform the above analysis, we have to study the dependence of the volume of oil and gas production on macroeconomic indicators.

Macroeconomic factors for 2000-2019 were taken as explanatory (independent) variables.

The volume of oil and gas production indicator for 2000 - 2019 (million tons) will be used as the dependent variable "Y".

4.2.1. Economic model

This objective can be translated to algebraic model as below:

$$Y_1 = f (X_1; X_2; X_3; X_4; X_5; X_6;) \tag{9}$$

Where:

Y_1... Volume of oil and gas production, million tons

X_1... GDP, billions of US dollars

X_2... Inflation %

X_3... Unemployment %

X_4... Direct foreign investments, billion US dollars

X_5... Interest rate of the Central Bank

X_6... External debt level, USD billion

However, since the variables have different units of measurement, the power function will be used to be able to end up with a linear equation expressed in natural logarithm. The economic model is as follows:

$$y_{1t} = x_{1t}^{\gamma_1} \cdot x_{2t}^{\gamma_2} \cdot x_{3t}^{\gamma_3} \cdot x_{4t}^{\gamma_4} \cdot x_{5t}^{\gamma_5} \cdot x_{6t}^{\gamma_6} \tag{10}$$

This model assumes that the endogenous variable Y_{1t} Volume of oil and gas production, million tons is affected by the exogenous variables x_{1t} to x_{6t} namely: GDP,

billions of US dollars; Inflation %; Unemployment %; Direct foreign investments, billion US dollars; Interest rate of the Central Bank; External debt level, USD billion. The hypothesis is that all exogenous variables have direct relationship with the endogenous variable as expressed in the statements below:

H1: If the GDP increases, the Volume of oil and gas production increases.

H2: If the Inflation % increases, the Volume of oil and gas production increases.

H3: If the Direct foreign investments increase, the Volume of oil and gas production increases.

H4: If the Interest rate of the Central Bank increases, the Volume of oil and gas production increases.

4.2.2. Econometric model

Transforming to linear form will result to below equation, using semi-log form, a one-equation linear form expressed as:

$$y_{1t} = \gamma_0 lnx_{0t} + \gamma_1 lnx_{1t} + \gamma_2 lnx_{2t} + \gamma_3 lnx_{3t} + \gamma_4 lnx_{4t} + \gamma_5 lnx_{5t} + \gamma_6 lnx_{6t} + \varepsilon u_t$$

(11)

4.2.3. Correlation matrix

A correlation matrix was generated in Gretl using the above data with the following results:

Table №2. Multicollinearity of data

l_x1	l_x2	l_x3	l_x4	l_x5	l_x6	
1.0000	-0.0888	-0.9548	0.3829	-0.2480	0.9842	l_x1
	1.0000	0.2005	0.2616	0.4518	-0.0358	l_x2
		1.0000	-0.2672	0.1947	-0.9564	l_x3
			1.0000	-0.1265	0.3813	l_x4
				1.0000	-0.1420	l_x5
					1.0000	l_x6

Source: Gretl results

Based on the calculation above we can state that there are high correlations between variables l_x3 and l_x1 – 0.9548, between l_x6 and l_x1 – 0.9842 and l_x6 and l_x3 – 0.9564. Here we could refer to removing the variables l_x3 and l_x6 from the model, as they are highly correlated. Then, run another correlation matrix in GRETL.

Table №3. New correlation matrix from GRETL

l_x1	l_x2	l_x4	l_x5	
1.0000	-0.0888	0.3829	-0.2480	l_x1
	1.0000	0.2616	0.4518	l_x2
		1.0000	-0.1265	l_x4
			1.0000	l_x5

Source: Gretl results

We can see that multicollinearity between variables has been eliminated and therefore the following steps in econometric analysis can be performed.

4.2.4. Estimation of parameters

The model parameters are estimated using the Gretl software and shown in the table below. Full results from Gretl can be found in the Appendix (Appendixes 2-4).

Table №4. Estimated parameters

Parameters	Value of parameters
γ_0	-12.3746
γ_1… GDP, billions of US dollars	19.5217
γ_2… Inflation %	-5.77893
γ_3 ... Direct foreign investments, billions of US dollars	-1.94284
γ_4 ... Interest rate of the Central Bank (weighted average for year)	3.84332

Source: Own elaboration based on Gretl results

Substituting the above results to the one-equation econometric model will result to the final equation:

$$y_{1t} = -12.3746 + 19.5217\,lnx_{1t} - 5.77893\,lnx_{2t} - 1.94284\,lnx_{3t} + 3.84332\,lnx_{4t} \qquad (12)$$

4.2.5. Economic verification

Verification of the model is important in order to determine the quality of the econometric model. We have to assess the direction and intensity of the effect caused by explanatory variables on the explained variable.

- If the GDP (billions of US dollars) increases by 1%, Volume of oil and gas production increases by $\frac{19,5217}{100} \cdot 1000 = 195,217$ thousand of tons, ceteris paribus
  - This corresponds to the hypothesis of direct relationship between GDP and Volume of oil and gas production, the intensity of the estimated parameter is also acceptable.

- If Inflation increases by 1 %, Volume of oil and gas production decreases by $\frac{5.77893}{100} \cdot 1000 = 57,7893$ thousand of tons, ceteris paribus
  - This result does not correspond to the hypothesis of direct relationship.

- If Direct foreign investments decrease by 1 %, Volume of oil and gas production increases by $\frac{1.94284}{100} \cdot 1000 = 19,4284$ thousand of tons, ceteris paribus
  - This result does not correspond to the hypothesis of direct relationship. However, this is due to the fact that a possible decrease in foreign direct investment in other sectors of the economy will lead to an increase in oil production, since the country's economy depends on oil production, and it has no choice but to increase oil production.

- If Interest rate of the Central Bank increases by 1 %, Volume of oil and gas production increases by $\frac{3.84332}{100} \cdot 1000 = 38,4332$ thousand of tons, ceteris paribus
  - This corresponds to the hypothesis of direct relationship between Interest rate of the Central Bank and Volume of oil and gas production, the intensity of the estimated parameter is also acceptable.

4.2.6. Statistical verification

The coefficient of determination R^2 resulted to a value of 0.953640 which means that 95,3640 % of the variance in the dependent variable is explained by the independent variables. On the other hand, the value of adjusted R^2 is 0.941278 which shows that 94,1278 % of changes in the endogenous variable can be explained by the exogenous variables.

Statistical significance of estimated parameters: t-test

The t-test is used to verify the statistical significance of the estimated parameters. The p-value of the estimated parameters in Gretl are shown in the table below.

Table №5. T-test

Parameters	Value of parameters	p-value	Significance at 0.1
γ_1	19.5217	5.84e-11	<0.10; significant
γ_2	−5.77893	0.1205	>0.10; not significant
γ_3	−1.94284	0.0700	<0.10; significant
γ_4	3.84332	0.3520	>0.10; not significant

Source: Own elaboration based on Gretl results

Given the significance level $\alpha = 0.10$ and the below hypothesis:

Null hypothesis (H_0): there is no relationship between the explained and explanatory variable

Alternative hypothesis (H_1): H_0 is not true

Then the following conclusions can be derived:
- γ_1 is less than the significance level $\alpha = 0.10$, therefore we reject H_0, there is sufficient evidence that the variable has effect on the population level
- γ_2 is greater than the significance level $\alpha = 0.10$, therefore H_0 cannot be rejected, there is no sufficient evidence of correlation between this variable and the endogenous variable
- γ_3 is less than the significance level $\alpha = 0.10$, therefore we reject H_0, there is sufficient evidence that the variable has effect on the population level

- γ_4 is greater than the significance level $\alpha = 0.10$, therefore H_0 cannot be rejected, there is no sufficient evidence of correlation between this variable and the endogenous variable

Statistical significance of estimated parameters: Confidence interval

The statistical significance of the estimated parameters can also be checked using the value of the confidence interval. At a significance level of 0.10, the confidence interval generated in Gretl is shown below.

Table №6. Confidence Interval

Parameters	Value of parameters	Confidence interval	Significance at 0,10
$\gamma 1$	19.5217	17.4255 to 21.6178	Significant
$\gamma 2$	-5.77893	-11.9333 to 0.375402	Significant
$\gamma 3$	-1.94284	-3.68858 to -0.197100	Significant
$\gamma 4$	3.84332	-3.17065 to 10.8573	Significant

Source: Own elaboration based on Gretl results

Statistical significance of entire model: F test

The resulting F-value $F_{(4,15)}$ in Gretl is 77.13901. This value is greater than the F critical value at given degrees of freedom $(n-p; \alpha)$ of 2.36143312.

Considering the hypotheses:

Null hypothesis (H_0): all explanatory variables taken jointly are not relevant

Alternative hypothesis (H_1): H0 is not true

Since $\widehat{F}$ 77.13901> F* (15-4; 0.10) 2.36143312: the model is statistically significant and H_0 is rejected.

4.2.7. Econometric verification

To verify the assumption in the model, an econometric check is performed. The tests that are associated with the stochastic component are the autocorrelation test, heteroskedasticity test and the normality test. These three tests were used for our model.

- Heteroskedasticity using White test

The resulting p-value from White Test is 0.264013, at significance level α of 0.10, the p-value is greater than the significance level and therefore there is constant variance on each conditional distribution of the error term, hence, we do not reject H_0

Null hypothesis (H_0): Heteroskedasticity is not present

Alternative hypothesis (H_1): Heteroskedasticity is present

- Non-autocorrelation assumption using Durbin Watson test

The Durbin-Watson test is used to test for autocorrelation. The Durbin-Watson value generated in Gretl software is 1.103676. Since the value is in the range of 1.5 to 2.5, it can be said that the correlation is still normal and should not be a cause for concern.

- Normality test

H_0: error is normally distributed

H_1: error is not normally distributed

Chi-square(2) = 2,196 with p-value = 0,3335

p-value 0,3335> 0.1 we do not reject $H_0 \rightarrow$ error is normally distributed.

5   Results and Discussion

The practical part of this thesis concerned, first of all, the discussion and analysis of the economy of Kazakhstan with an emphasis on its macroeconomic indicators, as well as identifying the relationship between macroeconomic indicators and the production of crude oil and gas in this country.

The main argument is that the oil industry in this country is one of the main components of the country's economy. Kazakhstan exports about 80% of the oil produced, which is 2/3 of revenues from foreign sales and forms almost three quarters of GDP. Thus, almost the entire Kazakhstan's economy depends on oil exports.

All set goals were achieved:

1. A brief retrospective analysis of the economy of Kazakhstan with an emphasis on its macroeconomic indicators was carried out.

Selected macroeconomic indicators such as GDP show how the economy of Kazakhstan has been gradually developing every year. From 2000 to 2011, Kazakhstan's GDP showed rapid double-digit real growth with short-term adjustments in 2008-2009 due to the impact of the global financial crisis. From 2012 to 2014, the country's growth rates have stabilized at the level of 4-6%. This dynamic of growth rates is explained by the significant consolidation of the country's economy against the background of high prices for oil and metals.

A characteristic feature of inflation in Kazakhstan is a stable, fairly high inflation rate, despite the efforts of the authorities.

This testifies, firstly, to the presence of certain constantly operating factors that affect the nature of monetary relations, and, secondly, to the limitations and inefficiency of existing methods of managing these relations.

With regard to the labor market in Kazakhstan, the country experiences various types of unemployment, such as natural and cyclical unemployment. There are factors such as a mismatch in demand in the labor market for specialties or qualifications, the applicant does not have the opportunity to find a job. Also, in construction and agriculture, seasonal demand is noticeable. In general, if we consider the period from 2000 to 2019, then the jump in the unemployment rate was recorded in 2000 (12.8%). Further, there is a further decrease in this indicator and in 2007 it reaches the level of 7.3%.

One of the pressing problems for Kazakhstan is the presence of a significant external debt, which directly affects both the rate of economic growth of the country and all areas of state policy. Research has shown that there is no systematic approach to external debt management in Kazakhstan. The lack of an effective system for monitoring external borrowings and proper control over their placement inside the country has created a threat to the national economic security of the Republic of Kazakhstan.

2. The current state of the oil industry in Kazakhstan was analyzed.

The oil and gas sector, as one of the leading branches of industrial production, is the basis for the development of the economy and largely determines the economic independence of the country.

As you can see, in 2000-2019, the production of oil and gas condensate increased 2.5 times.

Crude oil production in 2018 in physical terms amounted to 77.5 million tons, in 2017 - 72.9 million tons, in 2016 - 65.6 million tons. Crude oil production in 2018 increased by 16.4% compared to 2016 (by 11.9 million tons) [42].

The increase in oil production is mainly due to stable growth at the Kashagan (2018 - 13.2 million tons), Tengiz (2018 - 28.6 million tons) and Karachaganak (2018 - 11 million tons) fields.

The development of the oil and gas industry has provided strong support to the national economy - at the end of the eleven months of 2019, the industry's share in GDP was about 17%, which in turn made it possible to stimulate economic growth to 4.4% [41].

Existing trends indicate that the oil and gas industry of Kazakhstan continues to be in the zone of active growth, while maintaining high investment attractiveness.

3. The main importers of crude oil and gas in Kazakhstan were identified.

According to data for 2019, the main buyers of Kazakh oil are Italy, which accounts for 29% (1.8 million tons), France - 16% (1.0 million tons) and Switzerland - 11% (718 thousand tons)

4. The relationship between macroeconomic indicators and the oil industry was assessed.

Using data from 2000 to 2019, a regression analysis was performed in order to identify if there is a relationship among the endogenous variable Volume of oil and gas production and the exogenous variables: GDP, billions of US dollars; Inflation %, Unemployment %; Direct foreign investments, billion dollars; Interest rate of the Central Bank (weighted average for year); External debt level (USD billion). The computation was performed in Gretl and the resulting values show that the Volume of oil and gas production has a direct relationship with GDP (billions of US dollars), Interest rate of the Central Bank. However, it has an indirect relationship with Inflation %, which makes sense, because there is a possibility that inflation cannot directly affect the volume of oil and gas production; with Direct foreign investments, this in a way also makes sense because it is due to the fact that a possible decrease in foreign direct investment in other sectors of the economy will lead to an increase in oil production, since the country's economy depends on oil production, and it has no choice but to increase oil production.

The variable with the most significant effect to the Volume of oil and gas production are the GDP which has value of 19.5217. As the regression used is in the form of semi-logarithm, this can be interpreted such that a percent increase in the GDP will cause a 195,217 thousand of tons increase in the Volume of oil and gas production, ceteris paribus. On the other hand, an increase of 1% in the other variables Inflation, Direct foreign investments, Interest rate of the Central Bank will have the following effects to Volume of oil and gas production respectively: decrease of 57,7893 thousand of tons, decrease of 19,4284 thousand of tons and increase of 38,4332 thousand of tons.

6 Conclusion and Recommendation

Summing up our thesis, we can say that although time passes, and the world does not stand still, and at the present time there are many types of fuels and resources, the role of oil in the world arena remains one of the main ones. Namely, for Kazakhstan, the production and export of crude oil is a driver for the economy of Kazakhstan.

Kazakhstan, possessing significant reserves of hydrocarbons (about 3% of the world's reserves), is among the 15 leading countries in the world that produce these raw materials, along with the countries of the Middle East, Russia, Venezuela, China, Norway, and Canada, UK, Indonesia and Brazil. The oil and gas industry of the Republic of Kazakhstan is one of the main sectors of the country's economy. The current trend of active growth in this industry, along with the annual increase in oil production, contributes to the growth of Kazakhstan's attractiveness for foreign investment. Accordingly, attracting investment in the country's oil and gas industry will largely depend on the rise in world oil prices. It should be noted that a significant share (about 85%) of Kazakhstan's oil is exported.

Examining the macroeconomic indicators of Kazakhstan, we examined such indicators as GDP, Inflation, Unemployment, Foreign Direct Investment, Central Bank Interest Rate, External Debt.

And it was found out that over the years 2000-2019, the economy of Kazakhstan was developing steadily. It is also known that due to the raw material orientation and export orientation of the economy of Kazakhstan, its development is closely related to the situation in the commodity markets, primarily oil and metals.

The traditional markets for crude oil in Kazakhstan are Europe and Southeast Asia. The main buyers are concentrated in Europe, these are countries such as Italy, the Netherlands, France, Switzerland. However, the export map of Kazakhstani oil is changing.

If we talk about the current state of the oil industry in the country, then for the Kazakh economy, which is extremely dependent on the oil industry due to the fact that about 80% of the oil produced is exported, the current crisis has certainly become a difficult test. In addition to the forced reduction in oil production, the spread of Covid-19 imposes restrictions on the activities of oil companies, which has already led to a decrease in investment and a decrease in employment in the industry.

In the past two years, oil production in Kazakhstan has exceeded 90 million tons per year. Until that time, oil production had been in a state of stagnation for a long time - since

2010, annual production averaged about 80 million tons. The situation changed dramatically after the launch of Kashagan in the fall of 2016, which made it possible to increase production to the current level. At the same time, the decline in oil prices and Kazakhstan's participation in the OPEC + agreement on production limitation limit the possibility of further expansion of oil production. In addition, scheduled maintenance work is planned in the second half of 2020 at Tengiz and Karachaganak, which will lead to a decrease in oil production. As a result, this year the Ministry of Energy assumes that oil production will decline by about 7% yoy to 84.5 million tons.

Considering that the trend in the development of oil production in the country, a regression analysis was carried out to establish the influence of macroeconomic indicators such as GDP, Inflation, Unemployment, Foreign Direct Investment, Central Bank interest rate, External debt on the volume of oil and gas production. The results show that among the six variables GDP has the greatest impact on oil and gas production. Inflation, Foreign Direct Investment are indirectly related to the volume of oil and gas production.

Due to the limitations outlined in this article, it is recommended to consider the following for further research:

- Reveal the relationship between the oil industry and macroeconomic indicators using other indicators;
- Delve into the oil sector to determine which factors ultimately and have the greatest impact on the development of this industry.
- Study the oil industry of other countries and compare with the Kazakhstan oil industry.

The Republic of Kazakhstan may well continue to develop its oil activities, but one should not forget about other spheres of the country's activity in order for the country to enter the list of developed countries. However, it is necessary to take into account many other factors that go far beyond the scope of this article.

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8 Appendix

Appendix 1 Data set for Regression analysis

Variable	Volume of oil and gas production, million tons	GDP, billions of US dollars	Inflation %	Unemployment %	Direct foreign investments, billion dollars	Interest rate of the Central Bank (weighted average for year)	External debt level (USD billion)
2000	35,3	18,29	10	12,8	1,37	14	12,89
2001	39,9	22,15	6,58	10,4	2,82	11	15,34
2002	47,2	24,64	6,69	9,3	2,59	8	18,437
2003	51,3	30,83	7	8,8	2,48	7	23,227
2004	59,2	43,15	7,01	8,4	5,62	7	33,233
2005	61,5	57,13	7,87	8,1	2,55	8	43,862
2006	64,9	81	8,4	7,8	7,61	9	74,438
2007	67,2	104,85	18,77	7,3	11,97	9	96,241
2008	70,6	133,44	9,48	6,6	16,82	10,5	106,739
2009	76,5	115,31	6,38	6,6	14,28	8,6	109,741
2010	79,7	148,05	7,97	5,8	7,46	7	119,151
2011	80,1	192,63	7,43	5,4	13,76	7,5	124,33
2012	79,2	208	6,06	5,3	13,65	6,5	135,531
2013	81,8	236,64	4,9	5,2	10,01	5,5	149,708
2014	80,8	221,42	7,54	5	7,31	6	157,698
2015	79,3	184,39	13,53	5,1	6,58	13	153,18
2016	78	137,29	8,29	5	17,22	14	163,488
2017	86,2	166,81	7,22	4,9	4,71	10,25	158,949
2018	90,3	179,34	5,43	4,9	0,21	9	156,979
2019	90,5	181,67	5,43	4,8	3,59	9,25	156,263

Source: Compiled by the author based on data from The World Bank. https://data.worldbank.org/

Appendix 2 OLS

```
Model 1: OLS, using observations 2000-2019 (T = 20)
Dependent variable: y

             coefficient   std. error   t-ratio    p-value
    ----------------------------------------------------------
    const       -12.3746     10.5654      -1.171     0.2598
    l_x1         19.5217      1.19571      16.33      5.84e-11 ***
    l_x2         -5.77893     3.51064      -1.646     0.1205
    l_x4         -1.94284     0.995831     -1.951     0.0700   *
    l_x5          3.84332     4.00101       0.9606    0.3520

Mean dependent var    69.97500   S.D. dependent var    16.26565
Sum squared resid    233.0442    S.E. of regression     3.941609
R-squared              0.953640  Adjusted R-squared     0.941278
F(4, 15)              77.13901   P-value(F)             8.08e-10
Log-likelihood       -52.93373   Akaike criterion     115.8675
Schwarz criterion    120.8461    Hannan-Quinn         116.8393
rho                    0.374575  Durbin-Watson          1.103676

Excluding the constant, p-value was highest for variable 12 (l_x5)
```

Source: Gretl output

Appendix 3 White's Test for Heteroskedasticity

```
White's test for heteroskedasticity
OLS, using observations 2000-2019 (T = 20)
Dependent variable: uhat^2

             coefficient   std. error   t-ratio    p-value
    ----------------------------------------------------------
    const      300.498      493.318      0.6091     0.5690
    l_x1       -10.5551     129.271     -0.08165    0.9381
    l_x2        84.6405     223.804      0.3782     0.7208
    l_x4       122.436       94.4086     1.297      0.2513
    l_x5      -399.683      421.051     -0.9492     0.3861
    sq_l_x1      0.466700    24.3153     0.01919    0.9854
    X2_X3      -23.8161      29.3793    -0.8106     0.4544
    X2_X4       -6.69888     19.7792    -0.3387     0.7486
    X2_X5       26.6722      29.1167     0.9160     0.4017
    sq_l_x2      0.984688    29.7784     0.03307    0.9749
    X3_X4       28.1723      53.3659     0.5279     0.6201
    X3_X5      -24.9757      66.5053    -0.3755     0.7227
    sq_l_x4     -4.29892      3.36236   -1.279      0.2572
    X4_X5      -58.6908      58.2843    -1.007      0.3602
    sq_l_x5    102.063      108.775      0.9383     0.3912

    Unadjusted R-squared = 0.842726

Test statistic: TR^2 = 16.854520,
with p-value = P(Chi-square(14) > 16.854520) = 0.264013
```
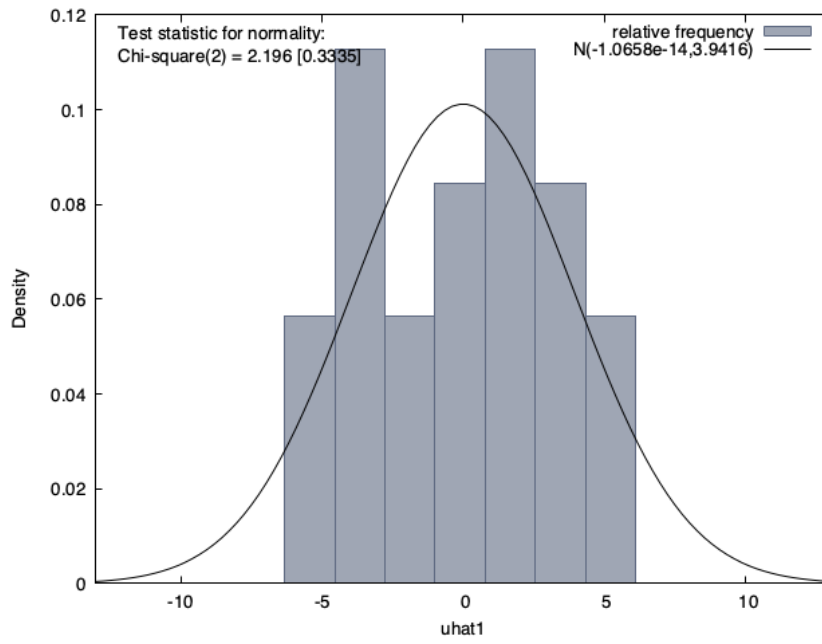
Source: Gretl output

Appendix 4 Normality Test

Source: Gretl output