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COVID-19 AS A MODERN DETERMINANT OF OIL DEMAND: PHARMACEUTICAL PERSPECTIVE

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INTRODUCTION

After the global financial and economic crisis of 2008, the objective need to "review" the mainstream of the existing provisions of economic theory and adapt them to the rapid response of the market and its subjects to external challenges is becoming more urgent. This fully corresponds to the conceptual approach that "when the predictions of a theory and empirical observations come into conflict, it is necessary to correct the theory" (Ostrom, 1990). According to classical economic theory, it is believed that all economic agents always behave rationally: they take into account all the risks, choose the best way out of any situation, and maximize the benefits.

However, at present, businesses in all countries are facing a recession, the presence of which is confirmed by many experts. For example, Russian researcher I. Lipsits believes that "the Russian economy and Russian society are on the verge of a crisis that may be more severe than in the 90s. The current contraction of the economy does not look like a V-shaped, U-shaped (slow recovery) or L-shaped (sharp decline followed by stagnation). It is rather / - shaped: a vertical line showing the fall of financial markets and the real economy" (Lipsits, 2020). A well-known American researcher Rubini N., who predicted the global financial crisis in 2008, is convinced that "the idea of a V-shaped recovery model is absurd" (Pyatin, 2020).

Within the framework of current restrictions and the inability to accurately predict their duration, state institutions of almost all countries emphasize the need and importance of studying existing global practices to support businesses and households that are in a difficult situation because of Covid-19, when the "emotion of fear" has become common and predominant in order to identify optimal and promising examples for subsequent replication (Movchan and Yakovleva, 2019; Rahman and Bobkova, 2017).

The relevance of the study is due to the relatively "young age" of behavioral economics, its theoretical provisions and practical conclusions in general, as well as the behavioral economy of today as a result of the Covid-19 pandemic, in particular.

It is particularly important to use behavioral economics methods to study the possible causes of financial crises (Korableva et al., 2019), which integrate the range of existing problems, generate new ones, and make it possible to assess the value of both the economy of countries as a whole, and for companies and individuals (Novoselov et al., 2019; Prischepa et al., 2020; Ustiuzhanin et al., 2019).

MATERIAL AND METHODS

Behavioral Economics has already offered an alternative view of complex modern problems (Van den Bos & McClure, 2012). It allowed us to present the description of the behavior of an economic agent in the economic environment with more complex and meaningful models than those proposed by neoclassics (Thaler, 2016). At the moment, having studied the publications of domestic and foreign authors, one can find many different variations of the concept of "financial crisis" and conclude that a single generally accepted version has not yet been formed. The concept of "crisis" comes from the Greek word "krisis", meaning "a change, a revolution, a decisive time of transition, a verdict, a decision on an issue, or in a doubtful situation."

The crisis is a sharp deterioration of the economic situation. It manifests itself in the decline of production and bankruptcy of enterprises (Kirman, 2010; Puryaev, 2020; Sychev et al., 2020; Dunets et al., 2019) the growth of inflation and unemployment (Fehr, Goette & Zehnder, 2008; Kashirskaya et al., 2020; Frolova et al., 2020) the decline in living standards (James, 2012) and the cost of financial assets. Consider the classification of financial (table.1) crises, which are a part of economic crises:

Behavioral financing is an innovative direction in the development of the modern economy. The basis was given to the theory of "Perspective Theory" by Daniel Kahneman (Kahneman, 2003) and Amosatverski (Tversky & Kahneman, 1971) and its further development by Richard Tyler (Thaler, 2014).

Behavioral Finance is a separate field in finance that deals with the explanation of financial market anomalies from the point of view of the psychology of economic agents.

The following are some of the author's definitions of "Behavioral finance" and "Behavioral economics". Colin Camerer (2014): "Behavioral economics uses models of systematic imperfections of human rationality for the theoretical and applied study of organizations, markets, and strategies (policy)… In a sense, behavioral economics has become the inevitable result of softening the assumption of perfect rationality". Camerer & Levenstein (2004): "Behavioral economics increases the explanatory power of economic theory by using more realistic psychological foundations… At the heart of behavioral economics is the belief that greater realism in the psychological foundation of economic analysis will improve economic theory on its own grounds".

Aric Angner (2012): "... behavioral economics is an attempt to improve the explanatory and predictive power of economic theory, offering it a more plausible psychological basis- it is better understood as a branch of cognitive science. Historically, as we have seen, behavioral economics has been a direct consequence of the cognitive revolution".

David Laibson and John List consider: "Behavioral economics uses variations of traditional economic assumptions (often with psychological motivation) to predict behavior and offer strategic recommendations" (Laibson, & List, 2015). Ernst Fehr: "Behavioral economics uses facts, models, and methods from related disciplines to combine descriptively accurate data on human cognitive abilities and social interactions and study their impact on economic behavior" (Fehr & Schmidt, 2005)

In general, it should be noted that it was from behavioral finance that psychological theories began to penetrate economic theory. Before that, the financial market was seen as a mechanical machine, lacking social factors. Thanks to this innovative direction, we can analyze processes that seemed to have been studied for a long time from a new perspective (Yakovleva, 2014; Kuzmin and Sharifullina, 2014; Kuzmin et al., 2018).

Thus, behavioral finance is one of the main applied tools of behavioral economics, as well as the architecture of choice, behavioral game theory. Neuroeconomics is more represented as an interdisciplinary tool, but also undoubtedly close to behavioral economics. That is, behavioral finance is an integral part of behavioral economics, focusing on its postulates such as understating / overreacting to information received, self-confidence, excessive optimism, and loss rejection.

Table 1. Types of financial crises (neoclassical theory)

Type	Characteristics	Example
The failures of "market bubbles"	If the price of an asset is higher than the income it generates, a "bubble"occurs in the economy. As a result, the "bubble" bursts, the value of assets falls sharply, and their holders become poorer. After such shocks, the "victims" begin to behave more carefully, and, as a result, there is a decrease in production volumes, new projects are postponed, and the hiring of new employees is reduced. There is a stagnation. "Market bubbles" are an excellent example of the impact of psychological factors in crisis situations.	Tulipanomania in the Netherlands, the excitement in the US stock market (the Great depression), the 2007 bubble in the US was mortgage-related securities market, etc.
Currency crisis	With an active outflow of foreign capital from the country, the exchange rate is under "pressure", especially if the country has adopted a "fixed rate" system (the state must either spend reserves to support the rate, or "allow" it to change dramatically). Most often, the currency sharply loses its value, which naturally leads to negative consequences both in the real and in the financial sector.	The sharp devaluation that occurred during the Asian crisis of 1997
Bank crisis	If banks violate their obligations to depositors and holders of bank obligations, terms of settlement and cash services, when their bankruptcy / liquidation happens, a banking crisis occurs. Banks stop issuing loans, which are very much needed by manufacturers to ensure the continued operation of the company. Thus, the crisis spreads throughout the economy.	Banking crises in Latin America in the 1980s
Stock crisis	The total collapse in the stock market, which is expressed by a significant drop in the value of securities, leads the economy to a stock crisis. It is important to mention that the securities market is highly volatile, that is, it is characterized by large fluctuations.	The crisis in the Russian government debt market, the collapse of the US stock market in 1929-1933.
Sovereign default	The state recognizes that it cannot pay its debts.	Crisis of 1998 in Russia.
Liquidity crisis	It describes one of the following situations: - the general state of mutual distrust in the banking system, which leads to the temporary disappearance of loans; - lack of cash, which is experienced by a particular company.	In the us market after the collapse of the 2007 bubble of securities related to mortgages.

Source: compiled from data (Abakumov & Ivanova, 2011)

RESULTS

A brief overview of the world economy from 2005 to early 2020.

So, behavioral finance as a result of the spread of Covid-19 and the compression of the economy and markets is based on the following provisions:

investors ' mistakes do not compensate for each other, but are correlated with each other;

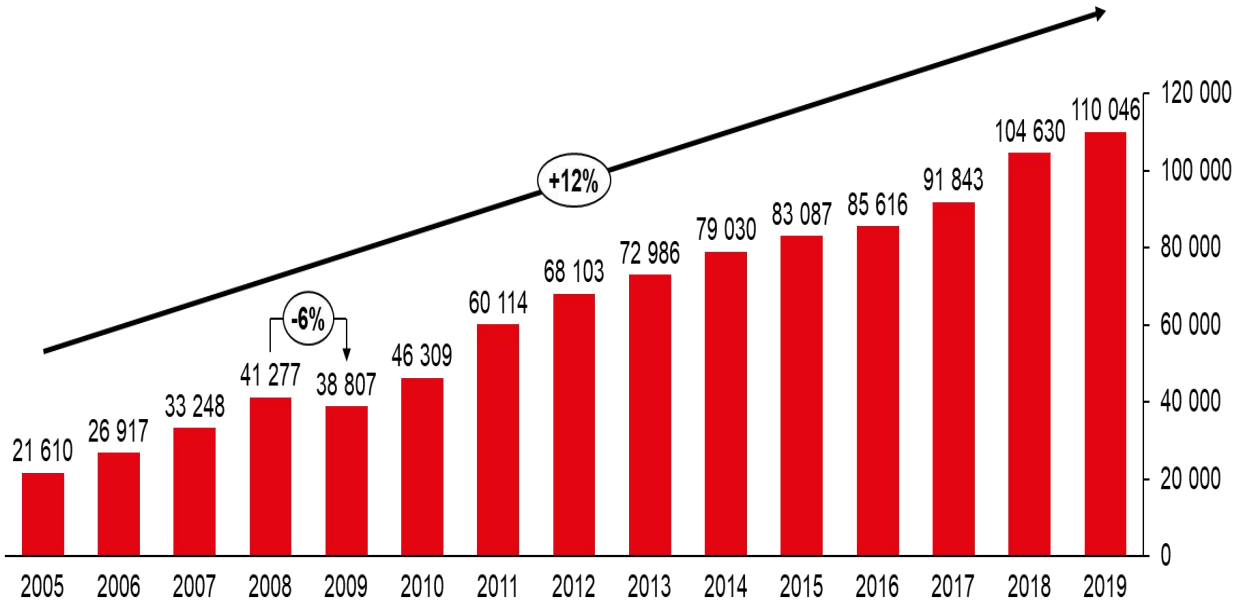
insufficient number of rational investors for the existence of an effective market;

investors react to unreliable, distorted information with too much return (understated or hyperbolized).

Let's look at the overall reaction of countries to the recent global financial crises.

The mortgage crisis, which began in the US in 2007, grew rapidly and in 2008 already turned into a global financial and economic crisis. We will see its negative consequences when analyzing the following data.

Figure 1 shows the dynamics of Russia's GDP at current prices from 2005 to 2019. Over all these years, Russia's GDP has shown an upward trend, with the exception of 2009. Compared to 2008, Russia's GDP fell by 6 %. The situation looks somewhat different when comparing the GDP of the world's strongest economies, including the Russian Federation, in US dollars.



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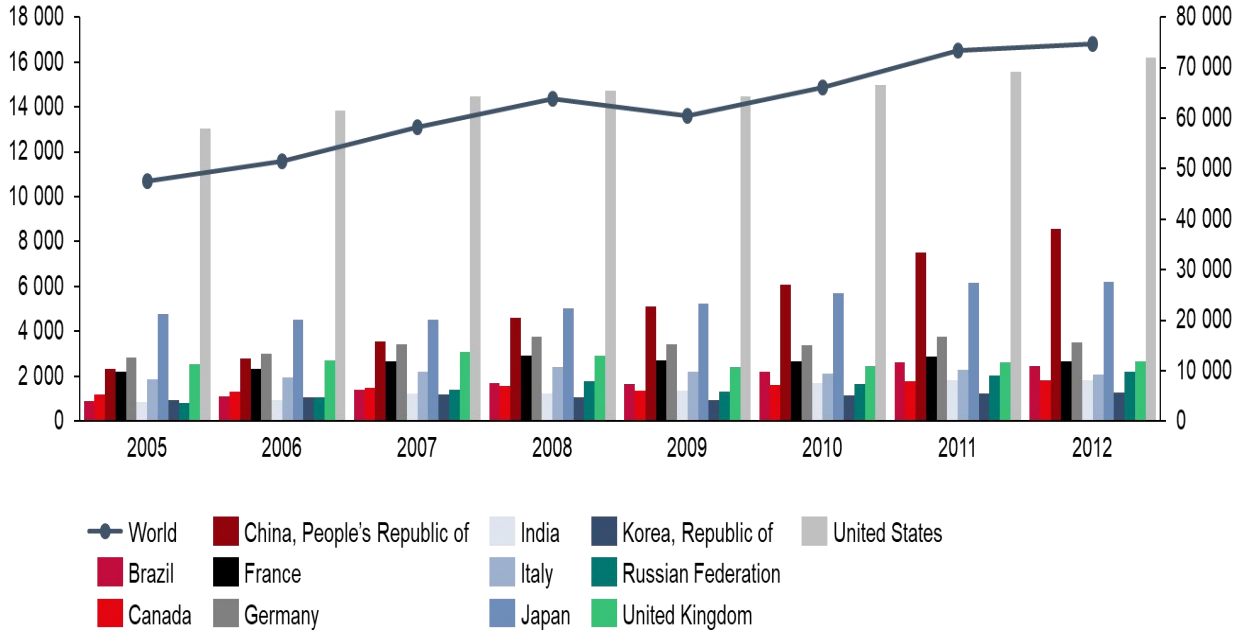
gure 1. Russian GDP at current prices 2005-2019, billion rubles
Compiled by the authors on (Rosstat. Data, 2020).

Figures 2 and 3 show the dynamics of the GDP of Russia and the world's strongest economies in US dollars over the same period. The right scale shows global GDP, while the left scale shows the GDP of individual countries. For more clarity, we will divide the period under review into 2 parts: 2005-2012, 2013-2019.



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gure 2. GDP of the world's leading economies at current prices in 2005-2012, billion dollars
Compiled by the authors based on (The International monetary Fund. Data, 2020)

First of all, it is worth noting China, which economy has been successfully developing in recent decades. Compared to 2005, China's GDP grew by 11,831. 36 billion dollars, or more than 6 times. Growth was particularly strong until 2011, after which it began to slow down somewhat.

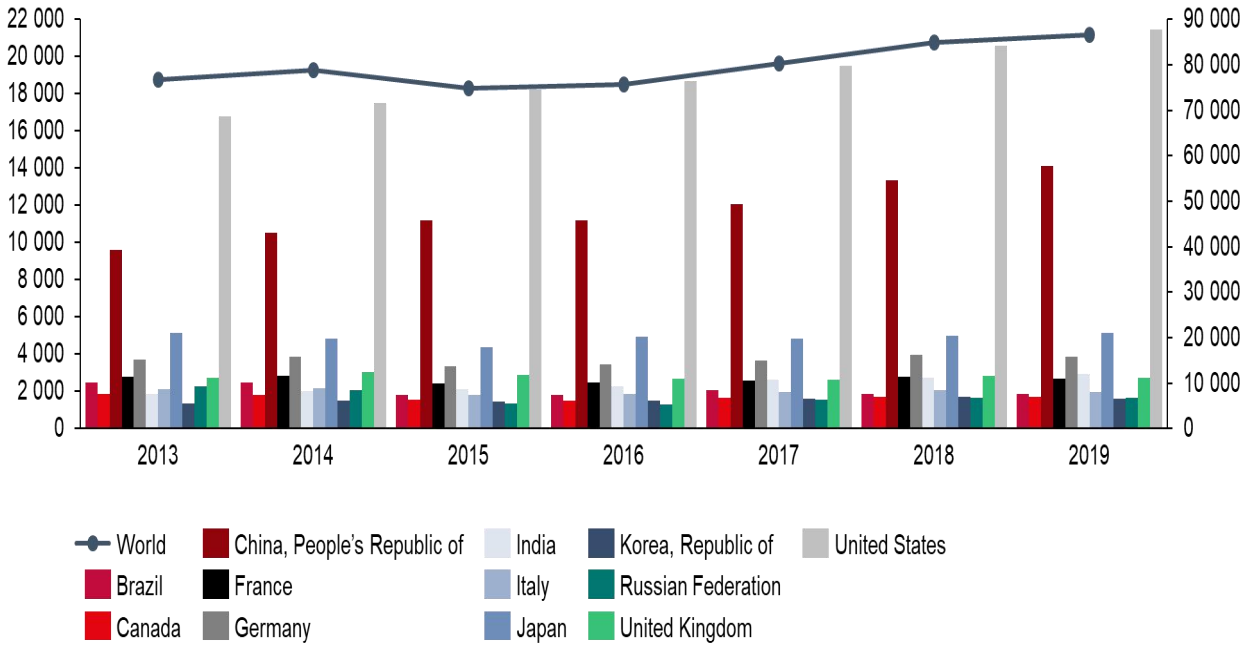


Figure 3. GDP of the world's leading economies at current prices 2013-2019, billion dollars
Compiled by the authors based on (The International monetary Fund. Data, 2020)

The US was and remains the world's strongest economy. During the period under review, only once GDP fell by 2 percentage points in the crisis year of 2009. From 2005 to 2019, the US GDP increased by 8,402. 83 billion dollars, or approximately 1.6 times.

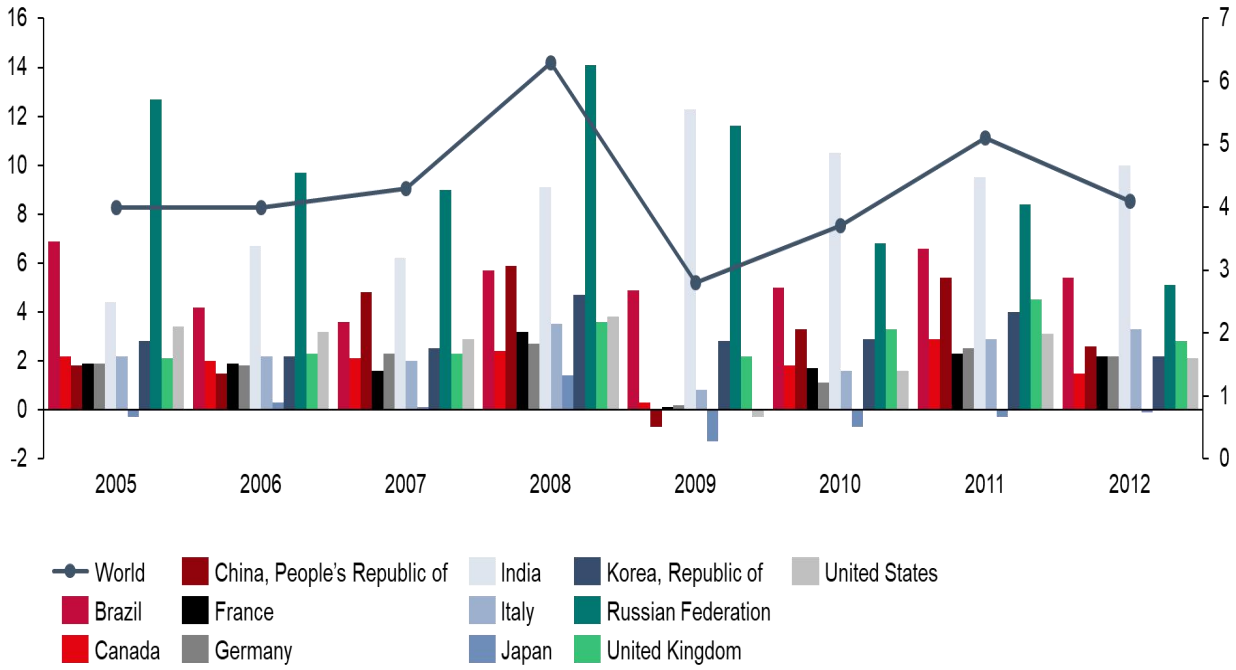
Also, the positive dynamics shows the GDP of India, only in 2008 decreased by 1 p. p. In 2019, compared with 2005, the GDP of India grew by 2101.35 billion dollars or approximately 3.5 times.

Speaking of the Russian economy, let's compare the dynamics of GDP in rubles and dollars (figure 4). In foreign currency, we see 2 strong declines in Russia's GDP: in the years of crisis for our country in 2009 and 2015, by 27 and 34%, respectively, due to the devaluation of the ruble.

Figure 4. Dynamics of Russia's GDP from 2005 to 2019 in billion rubles and billion US dollars
Compiled by the authors on (The International monetary Fund. Data, 2020), (Rosstat. Data, 2020).

With GDP growth, not only the economy, but also people feel more confident and calm. The high level of GDP shows that there are enough jobs in the country, all sectors of the economy are actively developing, and the country as a whole shows a high level of economic development.

Next, we will analyze inflation in Russia and the leading countries of the world. Consider the level of inflation calculated as a change in the average CPI-consumer price index. The CPI is a measure of the average price level in a country based on the cost of a typical basket of consumer goods and services over a given period. Figures 5 and 6 show that the highest inflation rates are in Russia, India, and Brazil, and the lowest in Japan.



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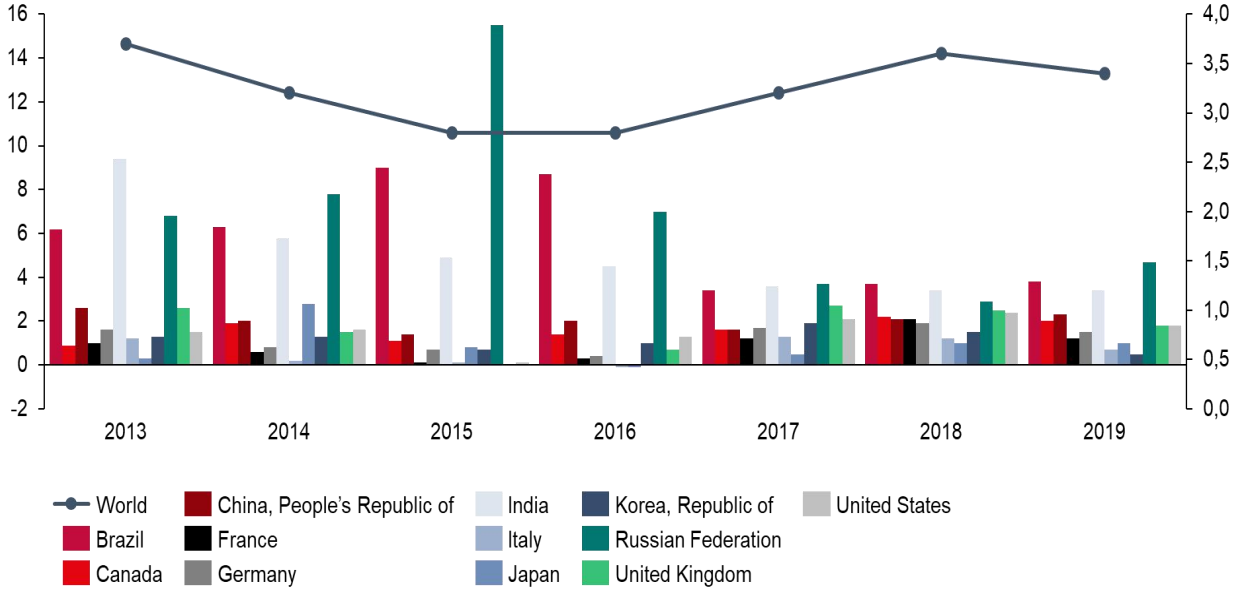
gure 5. Inflation in the world from 2005 to 2012, %
Compiled by the authors based on (The International monetary Fund. Data, 2020)

Relative to Russia, its peak values were 14.1% in 2008 and 15.5% in 2015. In 2014, there was a sharp increase in inflation by almost 2 times, in 2016, on the contrary, there was a sharp stabilization: the inflation rate showed values even lower than pre – crisis-7% against 7.8%. In 2019, according to the International monetary Fund, inflation in Russia was 4.7%.



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gure 6. Global Inflation from 2013 to 2019, %
Compiled by the authors based on (The International monetary Fund. Data, 2020)

India is in second place. The main trend here is a gradual decline in the inflation rate, starting in 2010. In 2009, inflation increased from 9.1% to 12.3%. In 2010, it was already 10.5%, and by the end of 2019, it reached 3.4%.

Brazil is in third place. After reaching a peak of 9% in 2015, the inflation rate began to decline and in 2019 it was 3.8%.

Speaking about Japan, the most noticeable phenomenon is the negative inflation rate in the crisis for the whole world in 2009 -1.3%. This is also the lowest inflation rate among all the countries considered for the period from 2005 to 2019. The Japanese economy is one of the few countries that experience long-term deflation (the process of reverse inflation, lowering the price level).

High inflation leads to a sharp increase in prices, to a deterioration in the welfare of the population and, as a result, to an increase in panic and anxiety, which can not lead to competent decision-making by economic agents.

Figure 7 shows the number of unemployed as a percentage of the country's total labor force.

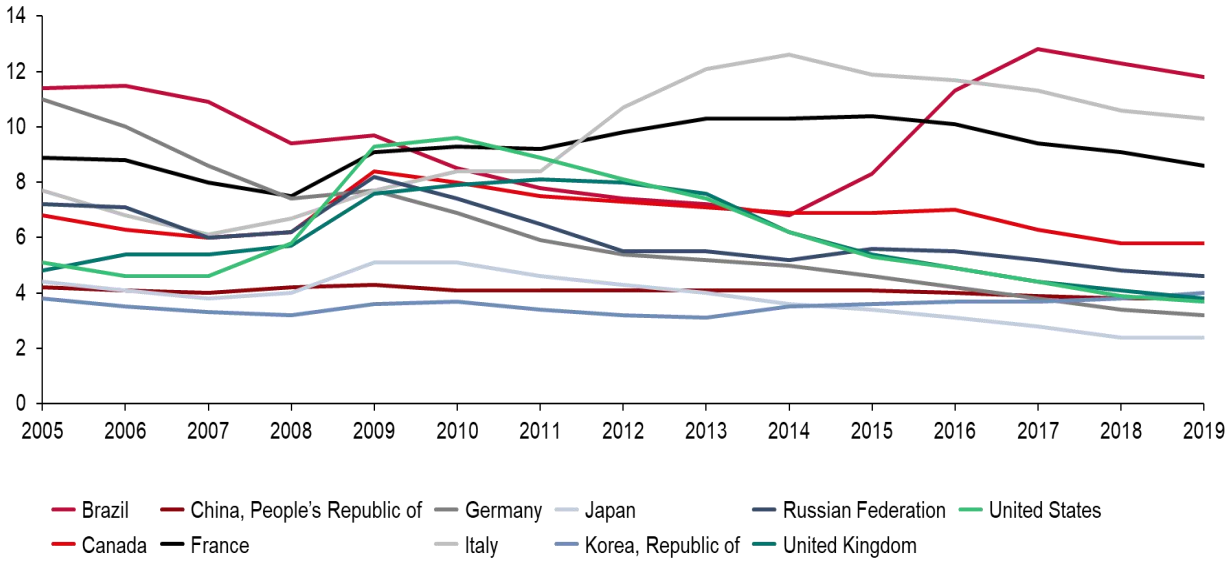


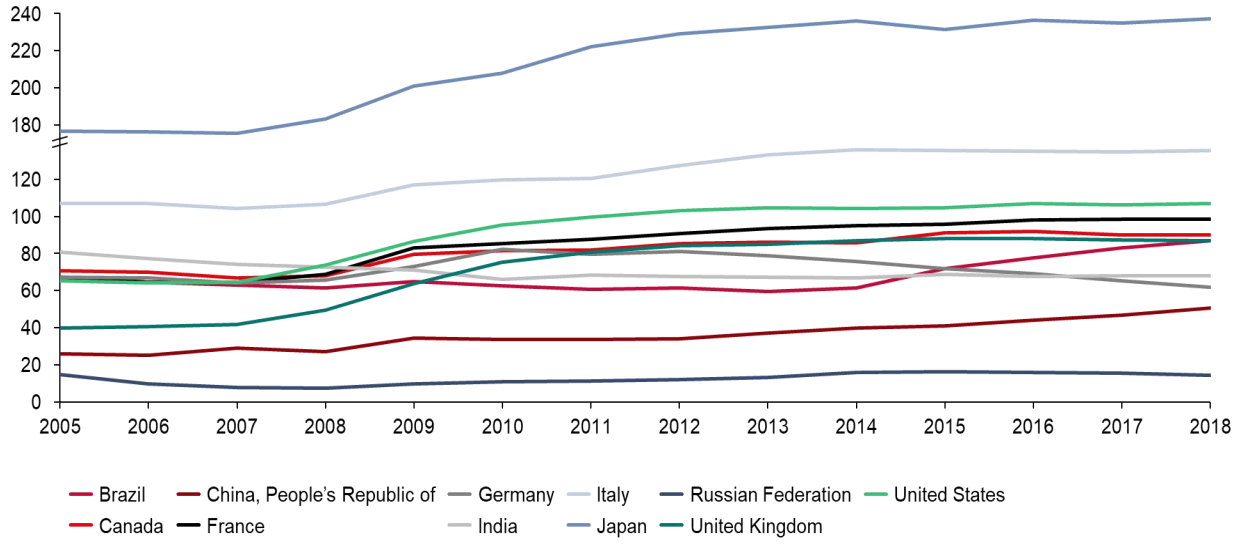
Figure 7. Number of unemployed as a % of the total labor force of the country, in the world from 2005 to 2019, %
Compiled by the authors based on (The International monetary Fund. Data, 2020)

Korea, China and Japan have the lowest unemployment rates. Up to 2014, the Republic of Korea had the lowest unemployment rate (3.5%), and from 2015 to 2019 – in Japan. The number of unemployed fell from 3.4% in 2015 to 2.4% in 2019.

The largest number of unemployed people is in Brazil, Italy and France. From 2005 to 2009, one or the other power was the leader in this indicator. It is also worth noting the sharp increase in unemployment in Russia and the United States in 2009 by ≈ 1.3 and ≈ 1.6 times, respectively. After this period of crisis in both countries there is a tendency to a gradual reduction in the number of unemployed.

When unemployment increases, discontent, concern of the population, tension in society increases, and economic activity slows down. People lose their professional qualifications, leading to increased marginalization of certain segments of the population and social apathy. All these human changes, of course, have a negative impact on the economic side of the state's life.

Next, we will analyze the public debt (as a % of GDP) of the countries under consideration (figure 8).



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gure 8. Global Public debt from 2005 to 2019, as % of GDP
Compiled by the authors based on (The International monetary Fund. Data, 2020)

According to this indicator, Japan is the leader, which public debt is more than 2 times higher than the country's GDP. According to the TASS News Agency, the main reason for the growth of Japan's public debt is the aging of the population. People over the age of 65 already make up more than 28% of Japan's population. The government has to increase the issue of government securities, since taxes alone are not enough to fully cover the country's social needs. It is worth saying that Japanese government securities are a reliable financial instrument that is in demand (Japan's national debt exceeds $10 trillion for the first time in history, 2019).

Russia has the lowest level of public debt. From 2005 to 2008, there was a downward trend from 14.84% of GDP to 7.44%, but from 2009 to 2015, the public debt began to increase, as it did in the world as a whole (from 9.91% to 16.38%). In recent years, from 2016 to 2018, there has been a decrease in the share of Russian public debt (16.08%, 15.46% and 14.60%, respectively).

As a result, it is not possible to say that a small public debt is good, but a large one is bad for the population. The welfare of the population in Japan is much higher than in Russia, despite the record numbers of public debt. The same can be said about trust to the state: in Japan, the level of trust is

much higher than in Russia, which also naturally affects the psychology of behavior. Citizens who do not trust their government are less likely to trust each other, and a decrease in the overall level of trust in society already has a direct negative effect on the development of the economy. A classic study by French economists shows the relationship between confidence and economic development. According to their estimates, the per capita income in Russia would be 69% higher if the level of trust was the same as in Sweden.

Research also shows that a low level of trust leads to a higher level of government regulation – one of the most important restrictions on business development in Russia (The lack of trust, lack of growth, 2019).

After a brief overview of the world economy in 2005-2019, we would like to consider the first months of the new decade. In January 2020, an epidemic broke out in Wuhan, China, caused by a new type of coronavirus, COVID – 19. Every month the number of cases increased. New cases of the disease appeared not only in China, but also around the world. As of April 10, the number of cases worldwide exceeded 1.5 million people. In the first place in terms of the number of infected were the United States, then European countries-Spain, Italy, France, Germany.

The new type of virus has had a major impact on the world economy. According to the Bloomberg News Agency and the IMF, the economy will not recover soon and only by 2021, 2022, GDP will return to pre-crisis levels. The coronavirus pandemic will lead to the deepest crisis since the great depression.

According to RBC, experts from the Institute of international Finance (IIF) calculated that in 2019, global debt reached a record level of 255 trillion dollars, which is 10 trillion dollars more than the value of 2018. At the beginning of April 2020, it is 87 trillion dollars or 40 percentage points higher than at the beginning of the crisis in 2008-2009.

The WTO, the world trade organization, claims that the volume of world trade in 2020 will fall by 13-32% and the fall will also exceed the values of the crisis of 2008-2009. (Bloomberg estimated the loss of the world economy from coronavirus at $5 trillion, 2020)

According to the International labour organization (ILO), between 5.3 and 24.7 million people may lose their jobs due to the coronavirus pandemic. According to RIA during the crisis of 2008-2009 22 million people lost their jobs (Predicted loss of up to 25 million jobs worldwide due to coronavirus, 2020).

According to Forbes, the coronavirus pandemic will bring with it the "economy of fear": a decline in production, demand for certain types of goods and services (tourism, hotels, cinemas and shopping centers, luxury goods, raw materials, etc.).The epidemic has had a huge impact on both business and consumers.

There is a tendency to switch to remote operation mode. As practice has shown, a significant number of workers are able to work even in quarantine. After the end of the epidemic, companies may reconsider renting office space, which is one of the largest cost items. Also, the transition to remote work will have an impact on such areas as transport and technology (Puryaev and Puryaev, 2020).

There is also an increase in online trading, which somewhat smooths the situation with a drop in demand due to the pandemic. Netflix, Amazon, Zoom, and various platforms that sell computer (including online) games are experiencing rapid growth (The economy of fear: how coronavirus will change businesses and consumers, 2020).

COVID-19 AND THE GLOBAL DECLINE IN OIL PRODUCTION INVESTMENT

The COVID-19 epidemic and the imposed restrictive measures triggered a global decline in demand in the oil market.

In this situation, the term structure of futures all grades of oil has shifted to the extreme contango (a situation where the cost of the nearest contract is lower prices on future contracts), due to the fact that contracts are coming under pressure from unsold volumes and growing stocks.

The tanker market is probably one of the few segments that showed positive dynamics in March. Due to the growing excess of oil and petroleum products on the market, the demand for time charters, including floating storage, has increased significantly. The freight rate for VLCC-class vessels carrying oil increased by 69% in March compared to the previous month.

The pandemic has created unique macroeconomic conditions that are not similar to those of past crises. Simultaneously with a sharp reduction in consumption and the inability to suspend oil production, markets faced a strong fall in stock indexes. Today, 80% of the world economy is in recession and idle.

Next, we will analyze the dynamics of oil prices as a key factor affecting the Russian economy.

First, let's look at the dynamics of oil prices. Let's take for analysis the average monthly quotes of Brent oil from 2005 to 2019. The maximum value of the oil price reached in June 2008, amounting to$ 139.83 per barrel, and the minimum value-in January 2016, amounting to $ 34.74 per barrel.

According to experts ' forecasts, by the end of 2020, the volume of world trade will decrease by 1.5% (in 2019, the global economy grew by 2.9% compared to the previous year). The OECD forecasts that the US economy will shrink by 4.1% in 2020 after growing by 2.3% in 2019. The Euro area is expected to decline even more: by 6% at the end of 2020, compared with growth of 1.2% in 2019. Similar forecasts are given by OPEC experts for other key economies of the world.

In general, the world economy will lose 1.5% of GDP in 2020. However, against the background of general degradation, China's GDP is projected to grow by 1.5% and India's is by 2% in 2020.

In most countries, recovery is not expected to start until the second half of Q3, and a return to normal economic activity is not expected until Q4. Nevertheless, the manufacturing PMI (business activity Index) in China in March has already entered a positive zone, showing 50.1 after falling to 40.3 in February. China can become the leader of the recovery.

Market experts agree that it is not necessary to expect an increase in oil prices in the near future. Their dynamics depend on the recovery of the world economy and the balance of supply and demand, leveling the excess of oil. However, with the end of quarantine measures, the crisis in the economy will continue. The situation on the oil market can only be expected to stabilize in the second half of 2020.

In an effort to alleviate the current supply and demand imbalance in the global oil market, on April 12, 2020, OPEC and non-cartel countries signed an agreement to reduce total oil production by 9.7 million barrels per day starting from May 1, 2020. From July, the reduction will be 7.7 million barrels, and from the beginning of 2021 – 5.8 million barrels.

After the agreement was reached, the price of oil rose slightly. It is expected that a number of countries outside the cartel will take on additional restrictions on oil production. The total reduction in production in the world may amount to about 19 million barrels per day. However, these measures have not yet been able to stabilize the situation. In this regard, OPEC expects that oil demand by the end of 2020 will fall by a record 6.85 million barrels per day (340 million tons per year), almost 60% of which (4 million barrels per day (200 million tons) will fall on developed countries.

The cartels call this decline the historical maximum. The reduction in demand in the second quarter of this year will be

about 12 million barrels per day, in the third quarter-about 6 million barrels per day and about 3.5 million barrels per day in the fourth quarter. OPEC oil production in 2020 will be 24.5 million barrels per day, which is about 5.4 million barrels per day less than the same indicator in 2019. At the same time, the production of non-OPEC producers will decrease by 1.5 million barrels per day (75 million tons) by the end of 2020, and the main share of this reduction will fall on Russia.

According to OPEC forecasts, in the second quarter of 2020, the excess oil on the market will reach 15 million barrels per day (186 million tons). Further development of the situation and prospects for oil price growth will depend on the speed of unloading oil storage facilities and getting rid of excess raw materials, which should balance supply and demand, OPEC experts cautiously note. At the same time, they emphasize that the impact of a number of factors is simply impossible to assess today. In particular, there is no reliable data on the dates of lifting restrictions on the population in various countries of the world and the rate of recovery of economic sectors. There are no competent estimates of the impact of logistics and the online shopping sector on the economy as a whole and on demand for hydrocarbons during the pandemic. Experts record the growth of the so-called online economy, but they cannot yet assess its impact on the overall picture.

Against the background of an oil excess, a significant reduction in global investment in hydrocarbon exploration and production is a forecast in 2020. If oil prices stabilize at $ 34 / bbl, RystadEnergy expects investment to fall by 17%, or $ 93 billion, this year for a total of about $ 450 billion, the largest decline in 13 years. If oil stops at $ 25/bbl, global investment could fall to about $ 380 billion in 2020 and fall to almost $ 300 billion. In 2021, it will be the maximum decline in 14 and 15 years, respectively. (COVID-19 Report - Scenarios and impact on global energy markets, 2020)

Oil production costs are expected to fall by 15-20% this year, which means that the reduction in investment will be between 80 and 100 billion dollars compared to the same indicator in 2019. Many major oil companies have already reviewed their investment portfolios to protect their finances in times of crisis. So, ExxonMobil is considering at least a 20 percent reduction in investment. Shell will also reduce investment by 20% this year. BP announced a planned cost reduction of 20%.

IMPACT OF COVID-19 ON THE OIL AND GAS INDUSTRY

The dire situation in the global oil industry is caused by a combination of factors such as the outbreak of the COVID-19 pandemic, strict restrictive measures aimed at fighting the virus, and a price war between producers. Based on these factors, the world economy is expected to experience the deepest crisis in the history of the oil and gas industry. An incredible blow for the oil and gas industry was the drop in demand by 30% in April, as well as almost 10% on average for the year. In the current situation, the main countries China and India will not be able to provide additional demand for oil in 2020.

For the first time in the modern history of the oil industry, producers had to face a global fall in oil prices caused by an imbalance between low demand and excess supply. From January to mid-April 2020, the price of Brent fell by 3.5 times.

It is also worth noting the conflicts that have arisen between the world's oil producers. However, due to the deterioration of the global economy, in particular the oil industry, oil producers were forced to sit down at the negotiating table. Thus, an agreement was reached between OPEC+ countries and, for the first time in history, non-coalition countries to reduce oil production for the next two years.

It is possible that this situation will bring negative consequences for Russia. In addition, there is already a decline in oil exports, in particular, there was a decrease in exports by 2.5% compared to 2019.

In fact, from the point of view of market competitiveness, Russian manufacturers look confident, since capital and operating costs are not high on average for the industry and are mostly denominated in rubles, which allows them to decrease in the conditions of devaluation. In addition, the Russian oil industry has a certain margin of safety due to the peculiarities of tax regulation, in which the risks of low oil prices are transferred to the budget (Mironova et al, 2020).

Obviously, the price war with Saudi Arabia has had a negative impact on Russian sales markets. Saudi Arabia's decision to reduce oil prices in April this year to $ 10 / bbl (Novak: the cost of producing a barrel of oil at new fields in Russia does not exceed $20, 2020) led to a decrease in the attractiveness of Russian-produced Urals oil. As of 21.04.2020, Russia was forced to reduce the price of oil to $ 10 / bbl. In this situation, we had to face the fact that the cost of oil at new fields exceeded the cost of real oil (the cost of 15-20 dollars/bbl), which negatively affects the economy. Russia sold oil without covering its production costs and causing enormous damage to producers.

Russia is under incredible pressure due to a sharp reduction in oil production. As a result of the meetings, the Russian Federation committed itself to reducing oil production by 1.8 bbl. in May-June, then until December, inclusive, 1.3 bbl. / day.

Compared to the reporting period, oil production in Russia will decrease by 0.95 million barrels per day. Based on these calculations, oil production in Russia as of this year should not exceed 515 million tons. After proportional distribution across all companies, the share of production of the company's PJSC " NC "Rosneft" will be only 660 thousand barrels per day (Quotas for reducing oil production by Russian companies were distributed proportionally, 2020).

In these conditions, it will be necessary to optimize the operation of oil refineries, as well as to close new exploration programs.

All companies in the oil and gas industry will experience negative consequences, but small and medium-sized enterprises will suffer greatly due to the fact that they have the lowest safety margin.

In the most optimistic scenario, revenues from raw oil exports (excluding petroleum products) will decrease by two and a half times compared to the pre-crisis scenario (from $ 124 billion in 2019 to $ 49 billion in 2020), however, more negative scenarios with a fall in budget revenues by 4 to 10 times in 2020 are quite possible. The most pessimistic scenario practically deprives the budget of revenue from met and resets the export duty, makes new projects unprofitable, and brings existing ones to the threshold of profitability.

In the current situation, methods to increase the efficiency of asset use presented in this chapter, are applicable in our time. The forecast of indicators, taking into account the applicable measures, is currently difficult to predict due to the situation with the world pandemic. But to increase the efficiency of assets while reducing costs, reduce costs, and reduce cycle time of product, these are measures that will help the company more carefully to survive the crisis.

It is worth noting that the pandemic affected not only the economic component of companies, but also the internal environment of the company.

According to the head of Rosneft Corporation Igor Sechin (Igor Sechin reported to the President of the Russian Federation on the implementation of major projects of Rosneft, 2020) : "We understand our responsibility – the most important responsibility – to preserve the health of our

employees, people, their families, and people. For this purpose, the company has organized 250 insulators in the regions of operation, 68 observatories, where the watch takes over before work. We have increased the inter-watch period from 30 days to 90, and people are understanding. And it brings results.»

INFLUENCE OF COVID-19 ON THE PETROCHEMICAL INDUSTRY

According to forecasts of the international Agency ICIS, in the medium term, demand for petrochemical products in most regions of the world will remain weak. According to Oxford Economics, global GDP will reduce by 3.5% in the second half of 2020. At the same time, experts ' forecasts continue to deteriorate: in one of the latest articles of the Economist magazine, it was suggested that the negative consequences of the crisis will affect up to 90% of the world economy.

IHS analysts believe that today there is no previous correlation between GDP and demand for petrochemical products. However, the level of uncertainty regarding consumption dynamics remains high. Much of the drop in GDP is due to stagnation in the service sector due to quarantine – travel bans, the closure of restaurants and hairdressers, etc. However, in the industry, declining inventories and investor uncertainty have also hit a number of sectors hard.

Adding to the uncertainty is the fact that many people have lost their jobs, and entrepreneurs have lost their business income. So in April 2020, the unemployment rate in the United States reached a record since the great depression-14.7%. Negative trends are also common in other countries: for example, in

In the UK, 43% of households, according to estimates by the Daily Mirror, have become worse off (Bank of England: In the third quarter, the demand of households in the UK for secured lending will grow, 2020). The consolation is that most workers (probably more than 50% in developed countries) have material savings. In addition, during the period of self-isolation, household living expenses decreased.

The world's most important question is the impact of oil prices on the chemical industry. In theory, lower prices reduce the cost of raw materials and, as a result, goods. According to the laws of Economics, this should cause an increase in demand. However, risk-averse consumers may prefer to save money rather than spend it even when prices are falling. In addition, other costs may increase: for example, stores have to spend more on cleaning and at the same time limit the flow of customers due to the need to control the social distance between customers.

If we talk about industries, then most of all, according to ICIS estimates (Petrochemical Analytics Tools, 2020), the automotive industry has suffered: the reduction in demand here by the end of 2020 may amount to 25%.

The affected sectors of the economy also include the furniture, textile, paper and printing industries and the household appliances segment. All of them offer non-essential goods, the demand for which has fallen. The production process in them is also disrupted. Interestingly, the construction industry, where certain types of critical work were not suspended, suffered less.

The deterioration of experts ' forecasts for 2021 mostly match to the revision of expectations for the current year, although the negative dynamics will be more smoothed. Oxford Economics believes that the economic impact of the crisis will be long-term and production in most sectors will continue to decline.

Experts ' opinions on the prospects of China's economy differ: many optimists believe that the country will overcome the crisis through fiscal and monetary stimulus. However, there is a deterrent in this scenario. When bans on visiting markets and shopping centers are removed, the risk of a second wave of infections will increase.

The recovery of China's economy, according to experts, can smooth the consequences of the pandemic for the world economy.

Second, the ability of the state to allocate additional financial resources for such measures is limited. In addition, the decline in economic activity around the world and the desire to localize supply chains may lead to a drop in demand for exports.

Therefore, according to analysts, economic growth in China in 2021 will be limited in all sectors except the food industry and the segment of hygiene products.

In Western countries, the effects of the pandemic will continue to be felt even after the associated restrictions are removed. We are talking in particular about the "bottlenecks" in transport and logistics, problems with staff recruitment and weak demand. Consonants for deconomics scenario (Global Scenarios Service. Quarterly updated macro scenarios for the global economy, 2020), production volumes will reach pre-crisis levels by the third quarter of 2021 in the United States and by the second quarter of 2021 in the Euro area.

The petrochemical industry is facing an unprecedented crisis. In the spring, the drop in demand for products in some segments reached 70%. Experts expect the recovery of consumption and prices in the market to pre-crisis levels in 2021-2022. However, the risk of a second wave of the epidemic remains.

Like the market as a whole, the segment of petroleum products faced a record fall in the spring and is just beginning to recover. For example, due to the coronavirus pandemic and quarantine restrictions, the demand for naphtha has fallen sharply. According to Argus, quotations for naphtha shipments in North-Western Europe (SZE) in March fell to $ 122/t (and reached a historical low since 1999). The price decreased against the background of a significant drop in demand from petrochemical companies, as well as gasoline producers. In may, prices began to rise, and in June, some market participants tried to replenish raw materials at reduced prices, which triggered an increase in prices and demand. However, experts are not sure about the long-term trend.

A similar situation was developed in the market of liquefied petroleum gases (LPG). At the beginning of spring-a sharp drop to extreme parameters, then a sharp rebound and recovery. In March-April, the price of LPG on the St. Petersburg international commodity exchange fell to 10-13 thousand rubles per ton. And since June 10, more than 35 thousand rubles have been asked for the same ton, which is 36% higher than the same indicator last year. Experts attributed the April drop in demand to the desire of consumers to minimize balances and thus avoid problems with sales in unstable economic conditions. A month later, the same consumers began to fill up their LPG reserves against the background of low prices and economic recovery. As a result, a sharp increase in raw material prices.

According to Him-Courier, in June, the contract price of benzene in Europe was 320 -325 dollars per ton, and in April, Russian benzene cost 189 dollars per ton. The same price dynamics was observed in the market of gasoline, aviation fuel and other refined products.

The price swings reflected a drop in export volumes in a number of areas. For example, the volume of exports of the same LPG to China fell by 29% – from 5.3 million tons in the fourth quarter of 2019 to 3.8 million tons in the first quarter of 2020, RuPEc reports. In order to compensate for the decline, a number of domestic manufacturers began to optimize the geography of deliveries.

The same factors influenced the market of polymers that are

actively used in medicine. According to (Rosstat. Data, 2020), for the first 4 months of 2020, the dynamics of prices for plastics in primary forms amounted to -17% in the domestic market and -22% - for export deliveries. The drop in price and consumption in the polymer market compensated for the growth in demand from suppliers of plastic packaging and medical devices.

The PVC and ABS plastic segments were more affected by the crisis. Major consumers of these polymers are the automotive industry and construction, which suffered significantly in the second quarter of 2020. Thus, according to (Rosstat. Data, 2020), the production of passenger cars in April decreased by 79.2% compared to last year. To a lesser degree affected consumer goods, electronics and packaging segments, where it is widely used HDPE (high-pressure polyethylene), LDPE (low-density polyethylene), PP (polypropylene), PET (polyethylene Terephthalate).They are produced on a commercial scale and are used in the production of packaging, fabrics, films, molded products for medicine, automotive, electronics and many other areas.

However, not all sectors were affected. A number of domestic enterprises managed to maintain high production indicators during the pandemic. This was due to increased demand for polymers from suppliers of plastic packaging, medical devices and non-woven materials for personal protective equipment. An important role was played by the fact that Russian companies, unlike foreign ones, did not stop production for quarantine.

As a result, for the first four months of this year, domestic enterprises increased the volume of production of polypropylene (PP) by 26%. The demand for plastic packaging, including Pattaro, in March-April increased by 15-20%. This caused a revival in the Russian market of polyethylene terephthalate (PET) and caused an increase in prices for raw materials.

The easing of restrictive measures taken in connection with the spread of infection stimulated the growth of demand for high-pressure polyethylene (HDPE). As a result, some brands went into the category of scarce, which led to a jump in prices.

Consonant prognos woodmackenzie (The Asia energy market outlook for 2020, 2020), by the end of 2020, global demand for polyolefins will decrease by 2.7% compared to 2019, or by 3.3 million tons. But in 2021, it may recover to the level of 2019.

An acute situation has developed in the rubber market, given the decline in the automotive industry – the main consumer of these materials. But the pandemic has stimulated demand for rubber from manufacturers of medical devices and gloves. This made it possible to partially compensate for the low consumption in the tire segment. Before the pandemic, the demand for nitrile gloves in Russia was 1-1. 2 billion pairs, but in two spring months it increased to 4 billion pairs.

According to forecasts of the Association of rubber producing countries (ANRPC) (ANRPC releases Natural Rubber Trends & Statistics, 2020), the fall in the volume of rubber production in the world by the end of 2020 will be 4.7%. It is expected that it will decrease by 300 thousand tons, to 13.13 million tons. Analysts of the Association believe that the market expects a slow recovery after the crisis.

The reduction in the cost of polymers negatively affected their recycling, calling into question its profitability. In some cases, it has become cheaper to use primary polymers. In addition, the attitude to plastic has changed dramatically: the pandemic has shown that the use of disposable products is safer than reusable ones in terms of spreading infection. And if in Europe recycling of polymers is provided by law, then domestic processors in this situation have much more difficult.

"A significant drop in the construction market as the main consumer of secondary pellets led to a 50-60% reduction in demand. The rapid decline in the cost of primary raw materials in some cases makes the use of secondary materials absolutely unprofitable.

Coronavirus has also made adjustments to the long-term Outlook, for example, in the EU's plans for recycling plastic packaging. The rational use of polymers is one of the important goals of European governments. In 2025, 55% of used plastic packaging and 77% of bottles were planned to be recycled in Europe.by 2030, the number of bottles collected for recycling was expected to increase to 90%. The crisis has cast doubt on the timing of these projects.

DISCUSSION

EIA specialists expect that the average price of Brent at the end of 2020 will be $ 38/bbl, which is $ 26 lower than in 2019, and in 2021 will reach $ 48/bbl – as the accumulated reserves decrease. In the third quarter, as restrictions are lifted, demand will begin to recover and will be only 6.7 million barrels per day (83.5 million tons/quarter) lower than in the third quarter of 2019. At the end of the year, oil consumption will fall by 8.3 million barrels per day (413 million tons per year) compared to 2019. In 2021, the world's oil demand will grow, but it will still be 1.1 million barrels per day. (57 million tons per year) below the level of 2019.

As a result, today a significant part of the waste intended for recycling is disposed of using traditional methods – through burial and incineration. This is also facilitated by a sharp drop in oil prices, which has reduced the cost of production of primary polymers and cast doubt on the profitability of refining. As a result, the achievement of the sustainable development goals (sdgs) was called into question. At the same time, the crisis demonstrated the shortcomings of short-term and product-specific solutions to the problem of plastic waste and the need for a systematic approach.

At the same time, global demand for certain types of plastic has increased: polypropylene used in medicine (for example, in N95 masks) and in take-away food packaging, polyethylene used in protective suits. As well as on PET used in disposable plastic water bottles and medical face screens. Due to the transition of restaurants to home delivery and consumer purchases of food and bottled water for the future, as well as the active use of personal protective equipment (PPE) by medical personnel, there has been a surge in the production of plastic waste, including hazardous waste in medical institutions and in quarantine zones infected with COVID – 19.

In connection with the risk of infection of many municipal authorities, airlines and other large organizations have been forced to abandon their programs for the collection and recycling of waste. At least 50 such programs in the United States have been reduced or suspended, and more than half of the States have put tare collection programs on hold. In an industry that is already overloaded with problems, materials that usually end up in recycling facilities are sent as solid waste directly to landfills and incinerators as a precautionary measure.

In accordance with international cargo transport regulations, infectious material with COVID-19 is classified as category B and is considered a dangerous substance due to health and safety risks. This classification imposes strict requirements on samples for the study of coronavirus infection and biologically dangerous waste generated in hospitals, medical institutions and quarantine facilities (gloves, masks, gowns, medical equipment, glassware or any materials that came into contact with the coronavirus).

Harsh requirements also apply to the handling, collection, sorting, packaging, storage, transportation, processing and disposal of such samples. Medical waste subject to state

regulation must be transported by qualified companies, and its disposal must be carried out at special facilities for hazardous waste that have the appropriate permits.

At the same time, despite the growing market for recycling plastic, glass, metal, paper and other materials, 85% of all medical waste is incinerated, although only 15% of it is classified as biologically hazardous. In fact, 25% of medical waste generated at US enterprises is pure uninfected plastic and can be recycled and reused, which is 1 million tons of valuable polymers annually.

As already mentioned, the reduction in processing reduces the volume of secondary raw materials in the supply chain, as well as suspends processes aimed at ensuring sustainable development and corporate social responsibility (CSR), and programs in the field of ecology, social sphere and corporate governance (ESG). The pandemic and the global economic crisis have cast doubt on the feasibility of declared international investment aimed at achieving the sdgs, as well as the prospects for a closed-loop economy.

However, it is worth noting that the crisis situation has not led to a decrease in awareness of innovative approaches to the processing of chemicals and the need for appropriate investments. They are used for recycling huge volumes of low-quality plastic mixtures that cannot be recycled by traditional mechanical systems. The need for regulatory reform in the industry has also not lost its relevance. There is still a need to improve the waste management infrastructure, to invest in transformational research and development of high-quality polymers, the number of processing cycles of which is not limited, as well as in cooperation between business and government at all levels.

CONCLUSOIN

The difficult conditions in which petrochemical companies have to work now have radically changed their business strategies. If earlier projects were considered for 10 years ahead, today the planning horizon is limited to 50 days. The main tasks were to survive and meet the needs of the health system.As a result of the crisis caused by the pandemic, the collection and processing of plastic waste has decreased and the demand for primary polymers has increased.

Another consequence of the pandemic was the return to the use of single-use plastic. Due to the fall in oil prices, which led to a significant decrease in the value of secondary raw materials, the production of primary plastic is now much cheaper. Bans on the use of polymers were lifted at the national and municipal levels, as well as at the level of individual companies due to the risk of COVID-19 infection. The pandemic has shown that society is not aware of the unintended consequences of a ban on the use of polymers if it is adopted without conducting a systematic strategic analysis of plastic waste and possible analogues to replace such products. This prohibition represents short-term solutions around a specific product and does not contribute to the development of a system-wide approach to the problem.

The crisis situation has shown the importance of analyzing all stages of the life cycle of goods for making informed decisions in the paradigm of sustainable development, taking into account environmental, social and economic aspects: mining, material processing, production, sale, use, transportation and disposal. This analysis will help prioritize resources and redirect investment, as well as encourage enterprise innovation at all stages of the product lifecycle.

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