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The Effects of Western Sanctions on Iranian and Russian Energy Economics: Evidence from Scenario Planning Method*

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Abstract

Economic sanctions, involving trade restrictions imposed by one country or a group of countries against another, come in various forms, such as tariffs, trade barriers, and import/export restrictions. In recent times, Iran and Russia have become targets of diverse economic sanctions imposed by the Western Bloc. Given that both countries heavily rely on their energy sectors as the bedrock of their economies, this study focuses on assessing the impact of Western sanctions on Iran and Russia's energy industries. Employing the Futurology method (Scenario planning), the research examines the effects of Western sanctions on the energy sectors of Iran and Russia, and explores their respective responses to mitigate these adverse consequences. The findings highlight four potential scenarios for the future of the Iranian and Russian energy sectors, based on two megatrends of sanctions and geopolitical tensions. Among these scenarios, the "Ideal scenario" emerges as the most favorable outcome, while the "Austerity scenario" poses the greatest challenges. Despite the short-term efficacy of these strategies, the study underscores heightened long-term investment risks in both nations. Consequently, foreign investors' participation in the oil and gas sectors of Iran and Russia is expected to decline.

Keywords: Economic Resiliency, Energy Sector, Financial System, Sanctions, Scenario Planning

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1. Introduction

Sanctions, also known as economic sanctions, encompass extensive or limited economic and trade restrictions imposed by one country or a group of countries against another. These measures can take various forms, including tariffs, trade barriers, and import/export quotas, among others. However, their scope is not limited to these examples. When investigating sanctions, two related concepts should be considered: economic isolation and economic Blockade. The sanctions process exhibits remarkable dynamism, resembling a random, exogenous, uncontrollable, and unpredictable phenomenon. Over the last decade, the nations of Iran and Russia have faced severe sanctions imposed by the Western Bloc.

Regarding Iran, the imposed sanctions have had severe impact on the country's economic prosperity. During the eleven-year period from 2011 to 2021, the real size of Iran's economy experienced a mere 10% increase, in stark contrast to the previous five-year period from 2007 to 2011, during which the country's economy grew by more than 11%. Data from the Central Bank of the Islamic Republic of Iran reveals considerable fluctuations in the economic growth rate over the past 15 years, with a striking 23% difference between the highest and lowest growth rates. This volatility and instability underscore the challenges faced by the Iranian economy (Table 1).

Table 1. GDP Growth of Iran, 2000- 2022, %

Year	GDP Growth (%)
2000	5.845527476
2001	2.392172712
2002	8.07882928
2003	8.639298397

Year	GDP Growth (%)
2004	4.336665979
2005	3.189804087
2006	4.999795262
2007	8.155773524
2008	0.250856553
2009	1.007385458
2010	5.797938302
2011	2.645717918
2012	-3.7471714
2013	-1.5219792
2014	4.984775067
2015	-1.42488494
2016	8.815086643
2017	2.758505246
2018	-2.25386361
2019	-2.65820666
2020	3.330288459
2021	4.719777732
2022	2.749166141

Source: Authors' Compilation from World Bank (b), n.d.

Rahimzadeh et al. (2022) assert that the West's imposed sanctions have significantly impacted Iran's economic mechanisms and structures over the past decades. Following the Islamic revolution's victory in 1979, Iran faced a series of sanctions. The initial round, spanning from 1979 to 1981, involved the confiscation of all Iranian government assets held in American banks, as well as the prohibition of food and pharmaceutical exports to Iran. Additionally, financial payments from Americans to Iranians were forbidden. The second round of sanctions coincided with the commencement of the Iraq-Iran war on 22

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September 1980, lasting from 1983 to 1995. During this period, the US Congress approved sanctions on the export of military equipment, American goods, deals for Iran's oil industry development, and mutual investments between Iran and the United States. The third period of sanctions began in 2009, aimed at curbing nuclear power growth and imposing an embargo on Iran's oil exports. Critical sanctions during this period involved measures against the central bank and a stricter ban on importing essential and primary goods. However, the most devastating impact on Iran's economy occurred during Donald Trump's presidency, leading to a 4.99% decline in Iran's GDP from 2017 to the end of 2020. In 2016, after signing the nuclear agreement, Iran experienced a short-term economic growth of 8.8% (Rasoulinezhad & Sabri, 1401 [2023 A.D.]). Nonetheless, during this period of sanctions, both exports and imports experienced a drastic decrease.

Regarding the economy of the Russian Federation, the conflict between Russia and the West, sparked by events such as the secession of Crimea in early 2014, which led to the imposition of sanctions by the West against Russia. These sanctions initially began with the Blocking of assets and travel bans for specific Russian individuals, but quickly escalated to encompass restrictions on investments in major companies operating in the Russian energy sector and capital inflows into prominent Russian banks. In response to the Western sanctions, Russia retaliated by implementing countermeasures against Western countries, particularly European nations. The aim was to mitigate the impact of the imposed sanctions on its economy. Strategies employed by Russia included the adoption of import substitution policies, increasing the use of domestically produced goods instead of imports, Russification of imported goods, and pivoting toward

Asian markets as alternative trade partners. Following the political and military conflict between Russia and Ukraine since February 24, 2022, the Western Bloc significantly intensified economic sanctions against the Russian economy. Table 2 indicates the changes in Russian GDP growth over 2000- 2022.

Table 2. GDP Growth of Russia, 2000- 2022, %

Year	GDP Growth (%)
2000	10.00006682
2001	5.100051225
2002	4.699991909
2003	7.299952345
2004	7.19994787
2005	6.399965448
2006	8.200068255
2007	8.499977768
2008	5.199969265
2009	-7.79999391
2010	4.5
2011	4.300029186
2012	4.024086157
2013	1.755422149
2014	0.736267221
2015	-1.97271923
2016	0.193690072
2017	1.825790064
2018	2.80724541
2019	2.198075714
2020	-2.6536545
2021	5.614290376
2022	-2.06971153

Source: Authors' Compilation from World Bank (a), n.d.

This comprehensive package of sanctions targeted various economic sectors, including banks, exports and imports, foreign direct investment (FDI), and businesses. According to Chen et al. (2023), these sanctions, resulting from the Russia-Ukraine conflict, have reshaped regional economic and financial interactions due to the undeniable role of the Russian economy in global economic growth progress. The far-reaching impact of these sanctions has altered economic dynamics not only in the region, but also on the global stage.

This paper employs the futurology method, specifically the scenario planning approach, renowned for its efficacy in analyzing complex and uncertain future scenarios, to comprehensively examine the multifaceted impacts of economic sanctions on the energy sectors of both Iran and Russia. Scenario planning involves a meticulous and systematic process that entails constructing a variety of plausible future scenarios by iteratively combining key uncertainties, critical factors, and various variables. This method goes beyond traditional linear forecasting by generating a diverse range of potential trajectories, accounting for the intricate interplay of economic, political, technological, and social dimensions. By leveraging this approach, the research explores the potential outcomes of the economic sanctions, allowing for an exploration of not only their most probable consequences, but also the less apparent yet plausible outcomes that may arise.

The paper is therefore organized as follows: Section 2, titled the "Interpretive History", delves into providing a contextual understanding of the subject matter through a historical lens. This section aims to uncover key events, trends, and shifts that have shaped the current landscape under examination. Following this, Section 3 elucidates the chosen "Research Methodology", detailing

the systematic approach adopted to gather and analyze relevant data. The methodology section outlines the tools, frameworks, and techniques employed in this research to ensure rigor and validity. Moving forward, Section 4 presents a comprehensive analysis of "Empirical Findings". Drawing upon the data collected and insights gained, this section systematically evaluates and interprets the empirical evidence to draw meaningful conclusions. Finally, in Section 5, the paper culminates with a thought-provoking discussion on "Policy Implications." This concluding section extrapolates the implications of the empirical findings to real-world scenarios and offers insights into potential courses of action for policymakers, practitioners, and stakeholders.

2. Interpretive History

2. 1. The Russian Context

Russia holds a prominent position as a major player in the global energy landscape, boasting abundant resources across various energy sectors. In terms of oil reserves, it stands strong at the 5th position worldwide, following Saudi Arabia, Canada, Iran, and Iraq, with 14.7 thousand million tons of proved oil reserves, accounting for 6.2% of the global oil reserves as of the end of 2019. Moreover, Russia claims the top spot for total proved natural gas reserves, possessing a staggering 38 trillion cubic meters of proved natural gas reserves, representing 19.1% of the global gas reserves at the end of 2019. Additionally, Russia secures the 2nd rank globally in coal reserves, holding an impressive 162,166 tons of proved coal reserves, contributing to 15.2% of the global coal reserves as of the end of 2019 (BP 2020). With such vast and diverse energy resources, Russia's position as a key player in the

global energy markets remains firmly established. Carbon-free sources of energy in Russia are predominantly represented by two key sectors: large-scale hydro and nuclear power. However, despite having substantial renewable energy potential, Russia's reliance on fossil fuels remains the primary focus. In 2015, renewables, which include hydro, solar, wind, biomass, and geothermal sources, accounted for a mere 3.2% of the country's total primary energy consumption. According to the draft Energy Strategy of Russia for the period up to 2035, this share is projected to marginally increase to 4.9% by 2035. Despite ranking 4th in the world for primary energy consumption, Russia's continued emphasis on fossil fuels hinders the development of its considerable renewable energy potential. The outlook for solar and wind energy remains limited, with their combined share in the Russian energy balance not expected to surpass 1% by 2035. While the country has significant potential to harness renewable sources, a stronger commitment to diversifying its energy mix is necessary to fully utilize these carbon-free options and achieve sustainable energy goals.

Russian energy production, consumption, and exports heavily revolve around fossil fuels, solidifying its position as a global leader in this sector. The country maintains a consistent top rank in gas exports, making it the world's leading exporter in this field. Similarly, Russia secures the second rank in oil exports and ranks third in coal exports. In contrast, renewable energy sources currently play a negligible role in the overall energy landscape of the country. Despite its significant fossil fuel dominance, there is substantial potential for Russia to diversify its energy portfolio and incorporate renewable sources to mitigate environmental impacts and enhance energy sustainability.

Ranked as the third-largest producer and consumer of energy

resources globally, Russia holds a significant position in the energy landscape, following China and the United States. Its energy production accounts for approximately 10% of the world's total, while its consumption constitutes around 5%. With an impressive energy production of about 1470 MTOE, Russia stands out as a dominant player in the global energy market by exporting more than half of the primary energy that it produces. Remarkably, these exports make 16% of the worldwide cross-regional energy trade, solidifying Russia's position as the unrivaled world leader in energy exports. This prominent role in the global energy trade further emphasizes Russia's influence and significance in shaping the dynamics of the international energy market.

Exports of conventional fuels play a vital role in supporting the state budget, key energy companies, and numerous regions within Russia. The well-being of these regions heavily relies on the revenues generated from hydrocarbon exports. As of 2020, oil and gas sectors contributed around a quarter of the country's GDP. Moreover, these sectors accounted for approximately 40-50% of federal budget revenues, 65-70% of foreign earnings from exports, and nearly a quarter of overall investments in the national economy. However, it is important to note that the data for 2022 might witness significant changes due to the impact of sanctions. The effects of sanctions are likely to influence the dynamics of the oil and gas sectors, potentially altering their contributions to the national economy and financial landscape.

Evaluating current status and structure of energy sector in Russia is worth considering various factors such as demography and macroeconomics, resources availability, the place of energy sector in the country' economy in general, the institutional framework of the sector and the latest technological policy. In

assessing the current status and structure of the energy sector in Russia, several critical factors must be taken into account. These factors encompass demographic and macroeconomic conditions, the availability of resources, the energy sector's overall significance within the country's economy, the existing institutional framework governing the sector, and the latest technological policies being implemented. As of the present, Russia's population stands at approximately 146 million people, and it has been experiencing stagnation since the 1990s. There are no signs of significant population growth, and even active migration from former Soviet republics is unlikely to fully compensate for the population decline. Moreover, the country's GDP growth rates have notably decreased from the robust 7-8% levels witnessed in the early 2000s to a range of 1.5-2.5% per annum. The impact of both COVID-19 pandemic and the sanctions imposed on the Russian economy remains uncertain, as vital data is not readily available to the public. Given the prevailing circumstances, it is reasonable to anticipate negative growth in 2021-2022. The complex interplay of demographic trends, macroeconomic conditions, international sanctions, and pandemic-related disruptions pose significant challenges to Russia's economic outlook, warranting cautious observation and analysis by economic experts and policymakers.

The domestic energy demand in Russia is also experiencing stagnation. Over the last decade, the electricity market has been facing an oversupply of energy, leading to challenges in securing cost-effective financing and hindered export opportunities. Coupled with the scarcity of local technological solutions, the conditions are not conducive to significant investments in new assets and capacities. As a result, the existing asset structure within the energy sector remains relatively static and unresponsive to substantial

changes. This situation highlights the need for strategic planning and innovative approaches to modernize and optimize the energy sector, ensuring that it remains resilient and adaptable to future demands and challenges.

Over the past decade, the composition of Russia's domestic energy balance has remained relatively stable. Natural gas continues to dominate, accounting for 53% of the energy mix, followed by coal at 18%, and oil-based liquid fuels at 18%. The share of renewables, including hydro, solar, wind, biomass, and geothermal sources, remains relatively modest, standing at 3.6%. During the 2010s, Russia experienced a significant surge in energy exports, reaching 56% of total production, solidifying its position as an "energy superpower" on the global stage. However, due to various macroeconomic factors, the growth in energy exports stalled in subsequent years. Currently, Russia is undergoing a fundamental transformation, and the role of hydrocarbons is expected to evolve over the next two decades. As the global energy landscape shifts and climate concerns intensify, Russia will face the challenge of adapting its energy sector to meet changing demands and international expectations. Emphasizing innovation, diversification, and investment in renewable and cleaner energy sources will be critical for Russia to navigate this transition successfully and ensure its long-term energy security and competitiveness.

In addition to the sanctions imposed by the US and EU, many financial institutions are now showing reluctance to finance fossil fuel projects due to their climate-saving strategies. This poses significant challenges in attracting sufficient investments for countries heavily reliant on fossil fuels. Furthermore, the introduction of carbon taxation mechanisms could further

exacerbate long-term economic instability for such economies. As the global focus on sustainability and climate change intensifies, countries heavily dependent on fossil fuels will face increasing pressure in transitioning to cleaner and more sustainable energy sources in order to secure a stable and resilient future.

The impact of sanctions on Russia's economy, particularly the energy sector, necessitates an assessment from the perspective of energy security. This evaluation aims to understand the short-, mid-, and long-term consequences, and gauges the resilience of the energy security system. Presently, these sanctions give rise to various external, internal, and cross-border risks, as outlined in the Security Doctrine of 2019. In relation to external and cross-border risks, the following considerations must be acknowledged:

- The strict prohibitions preventing American and European companies from participating in energy projects in Russia, coupled with restrictions on Russian companies borrowing from Western financial institutes, have already inflicted damage on the local energy sector, particularly concerning complex upstream projects.
- The significant technological advancement gap between Russian energy companies and international leaders in this industry renders it challenging to maintain previous levels of development in terms of both time and quality.
- The aforementioned lag has inevitably arisen due to the dominance of certain Western IT, upstream, and equipment producers who have been critical players in Russia's energy market for the past 30 years.

Russian energy sector was developed based on an export-oriented model, relying heavily on critical investments in upstream

and midstream facilities (such as pipelines, LNG plants, vessels fleet, and seaports) to support natural resource production and exports. As a prominent exporter, Russia's energy industry has embraced cutting-edge solutions backed by international investments, leading to a strong reliance on Western equipment, technology, IT, finance, and legal support. However, the country's exclusion from the pool of key global suppliers has prompted a reassessment of this dependence on external factors. This process is highly complex and will take years, resulting in long-term prospects. Meanwhile, one viable approach to withstand sanctions is to maintain a similar structure, while substituting technology, equipment, and investment suppliers and rerouting its export activities. This strategy allows for adaptability while preserving the fundamental structure of the energy sector in the face of sanctions.

This approach offers evident advantages, as it enables the avoidance of a severe economic crisis and the continued development of an export-oriented economy, leveraging existing value chains, while geographically substituting key elements. This includes introducing new variables such as currency, insurance, and investment diversification. However, it should be noted that while this approach addresses certain external risks, it may not adequately address potential internal risks, leading to the emergence of new "bottlenecks" within the system. These internal challenges could pose obstacles to achieving long-term sustainability and resilience in the face of sanctions.

The announced "import substitution" program has encountered challenges in its implementation, as locally produced machines and equipment still heavily rely on Western parts, particularly in the field of microelectronics. R&D projects have been underfunded, preventing them from effectively competing on an international

scale and limiting their widespread adoption domestically. The impact of sanctions coincided with the natural aging and depreciation of facilities and equipment, leading to reduced upstream production and project efficiency. These production cuts could, in turn, adversely affect Russian exports, leading to a budget deficit and decreased R&D investments, thus creating a self-perpetuating cycle. Additionally, there is a potential risk of human resources shortages, as personnel from foreign upstream technological leaders (e.g., Baker Hughes, Halliburton, Schlumberger) leave the country. Replacing them with local human resources of the same efficiency level is a complex and time-consuming process. In the short term, assessing three key aspects becomes crucial when evaluating the impact of sanctions, while long-term forecasts remain uncertain due to the multitude of political, economic, and technological factors beyond our immediate control.

According to Novak's interview in December 2022, gas production in Russia is projected to decline by 18-20%, reaching 671 billion cubic meters in 2022. The local market is expected to consume 470 billion cubic meters. Reuters reports the possibility of one million tons per day decrease in oil production. To put this into perspective, Russia experienced two million barrels per day decrease in oil production due to COVID-19 restrictions, leading to a long-term cut of 300 thousand barrels per day in production facilities, as reported by Energy Intelligence. OPEC's scenario, although optimistic, suggests that liquid hydrocarbons production will decrease by 320 thousand barrels per day in the 4th quarter of 2022, reaching 10.59 million barrels per day. In the 1st quarter of 2023, production is expected to decline further by 670 thousand barrels per day to 9.92 million barrels per day. However, a

production recovery is anticipated in the second quarter of 2023, reaching 10.06 million barrels per day and 10.19 million barrels per day at the end of 2023. According to *The Economist* (2022), there are concerns about oil logistics and price caps potentially leading to more unpleasant consequences.

Rystad Energy presumed that in 2-3 months, the world might witness a deficit of 70vessels of 750 thousand bbl per day. Undoubtedly the so-called «grey market» will grow fast, incorporating mostly the fleet experienced in oil trade with already sanctioned countries- Iran and Venezuela. Furthermore, Russian companies will sail old and strongly repaired vessels to meet the demand. Some EU fleet owners will also transfer their vessels to operators beyond EU jurisdiction. As for insurance, the problem looks much more complicated. Asian and Middle East consumers interested in Russian oil do not have the appropriate local insurance companies available to deal with oil tankers and cover oil trade risks.

The specific oil delivery risks are too significant. For example, the payments on commitments could reach 500 million USD (in case of leakage). As a result, it requires private finance for reinsurance. China and India could probably provide state guarantees, but this mechanism is not precise. There is also the possibility that certain consumers beyond G7 will prefer to sacrifice their economic profits from Russian oil to cut political risks in dealing with the sanctioned country. The abovementioned circumstances could lead to a Russian oil export decrease and rocketing of oil prices.

The Economist issues a cautionary note about a potentially worse scenario if Russia deliberately decides to cut exports. Such a

situation could arise if China offers unfavorable conditions, prompting Russia to swiftly reduce its supply. President Putin and Novak have already warned that Russia would refrain from selling to countries supporting price caps, opting instead to redirect spare volumes to alternative markets or reduce production by an equivalent amount. However, at present, there remains uncertainty about whether Russia can effectively maintain its production and export levels at a sufficient level to achieve a balanced economy. The outcome hinges on the way in which Russia navigates its energy policies amid the changing dynamics of international relations and global energy demand.

The adaptation to a new reality is a rather hard process, mainly due to the structural peculiarities of Russian energy sector as well as its ties with the political system of the country. Historically, the Soviet and then Russian energy sector was developed in an extremely centralized manner. Russia has one of the world's largest national centralized power systems with a single dispatch control—as of 2017, the total length of its trunk networks was over 140 thousand km, of distribution networks over 2 million km, and the installed capacity of power plants was 246.9 GW.

Market reforms and privatization of energy assets in the 1990s created more competition in the sector, but still, the modern institutional framework of the Russian energy sector is characterized by high corporate concentration and a lack of market mechanisms. Privatization and decentralization are facing strong resistance from the authorities: they are regarded as a threat to the stability and reliability of the national energy system, as well as the national security. In 2022 this trend received an extra impulse.

Significantly remarkable in this regard is the oil sector transformation, which has experienced a dramatic transformation in

its corporate structure during the last two decades. At the end of the 1990s, all key Russian oil production assets were concentrated in private corporations, such as Yukos, Sibneft, Lukoil and Surgutneftegaz—which had become world-class vertically integrated oil companies, and state-controlled Rosneft accounted for less than 5% of the country's oil production. However, at the beginning of 2000s, certain groups of Russian oligarchs, after having concentrated in their hands significant financial resources from fossil fuel export, decided to expand their political power. This attempt to change balance in top political circles resulted in a number of sound legal processes. The oil sector gradually became dominated by state-controlled companies. This process started in 2003 with the Yukos case. In 2008 the "strategic fields" concept was introduced and state-controlled companies fixed their priority access to the most attractive hydrocarbon resources. As a result, the share of the smaller independent oil companies is just 4%.

Another key institutional challenge for the Russian oil sector is taxation. The current system of volume-based taxation creates no incentives for modernization and the development of smaller fields, or hard-to-recover and unconventional oil. In 2013–2014 a number of tax incentives were introduced for new fields and difficult-to-extract oil reserves. MET "tax holidays" for the fields in "difficult" regions were aimed to stop production decline, although they fail to solve the efficiency problem in general.

Different from the oil industry, the infrastructure-dependent gas industry (regarded as a 'natural monopoly', critical for the energy security of the country) was consolidated in the 1990s into a large state-controlled holding company, which includes gas exploration and production, pipeline transportation, and gas sales in domestic

and external markets—Gazprom—in order to concentrate resources in the painful period of non-payments and investment deficit.

However, during the last decade, the gas sector enjoyed increasing competition, which is mainly driven by Rosneft and Novatek, who increased their share in Russian gas production from 15% in 2008 to 33% in 2014. However, it is too early to say about real competitions—these companies are, in fact, creating regional monopolies. For example, Novatek accounts for nearly 100% of gas supplies to Russia's largest industrial area, the Chelyabinsk region. Rosneft, through its acquisition of Itera, has also secured the position of 100% gas supplier for the Sverdlovsk region. Furthermore, there are three other painful points in the modern development of the gas sector: low fixed prices on local market (unattractive for gas producers), significantly complicated access for third parties to mail pipeline system, and export restrictions for other producers, with an exception of Gaprom and Novatek.

Under current circumstances, the country will have to develop a new long-term vision for both domestic energy market development and export strategy. In general, Russia has many options to meet the energy transition reality by increasing energy efficiency, developing renewables, nuclear (next generation reactors on fast neutrons), and replacing oil by natural gas in transportation, LNG, hydrogen, expanding CCUS and Offsets.

2. 2. The Iranian Context

As of 2021, Iran holds the fifth position among the largest oil producers within OPEC and was the world's third-largest producer of natural gas in 2020. Iran is globally recognized for its substantial reserves of oil and natural gas, securing the third rank for crude oil

reserves and the second for natural gas reserves in 2021. However, it is crucial to note that despite these abundant reserves, the extraction and export of oil and gas have been on the decline in recent years, primarily due to hindered technological progress and reduced foreign investments in Iran's oil and gas industry, resulting from Western sanctions.

Compared to many countries in the Middle East, Iran possesses a relatively diverse economy; however, it remains heavily reliant on revenue generated from the export of crude oil and other petroleum products, which form a crucial pillar of its economic structure. In the fiscal year of 2020, the income derived from oil exports accounted for 40% of Iran's total government budget income. In 2020, the income from Iran's oil exports amounted to over 30 billion dollars, significantly lower than the approximately 66 billion dollars recorded in 2018. This decline can be attributed to various factors, including the impact of the COVID-19 pandemic and the effects of Western sanctions, which led to a reduction in the income generated from oil exports. Iran's economy has increasingly become reliant on crude oil exports (Rasoulinezhad & Sabri, 1400 [2021 A. D.]).

In 2021, Iran's economy exhibited a primary energy consumption of 11.7 quadrillion, establishing the country as the highest consumer in the Middle East. Within Iran's energy consumption portfolio, two primary sources, namely crude oil and natural gas, dominated the landscape. Following the withdrawal of the United States from the JCPOA in 2018, Iran experienced a significant decline in its crude oil production, which had reached a peak of 4.8 million barrels per day in 2017. By 2021, Iran's average crude oil production had decreased to approximately 3 million barrels per day. In early 2019, when certain importing countries,

such as India, were granted exemptions from Iran's oil sanctions by the United States, crude oil production in Iran increased, reaching around 2.6 million barrels per day. However, when this period of exemption expired in May 2019, Iran's crude oil production declined again, reaching 2.1 million barrels per day. The outbreak of the COVID-19 pandemic at the end of 2019 further impacted Iran's crude oil production, leading to a decrease to approximately 2 million barrels per day in 2020.

It appears that every aspect of Iran's oil industry, including crude oil, oil products, and petrochemical companies, has been subjected to American sanctions. The scope of sanctions has expanded to such an extent that even individual entities, ships, or persons are being scrutinized by American authorities with the aim of disrupting Iranian oil sales. However, the 13th government is actively pursuing measures to counter and remove these sanctions, while also implementing a strategic policy to neutralize their effects. Despite the challenging circumstances and the pressure of sanctions, the government has made significant progress in advancing a strategic market-building plan for the oil industry over the past year. This strategic approach seeks to mitigate the impact of sanctions and enhance the resilience of Iran's oil sector in the face of external pressures.

The impact of Western sanctions on Iran has been felt across various economic sectors, with the energy sector being particularly affected, given its role as the primary driver of budget incomes. According to CNBC (2021), “there are billions of petro-dollars sitting in banks in Iraq and China and South Korea … that Iran cannot get its hands on due to the sanctions”. In addition, as noted by Nakhli et al. (2021), the sanctions on oil-related activities have had far-reaching implications, influencing Iran's export potential,

technological progress in extraction, and financial transfers, leading to fluctuations in macroeconomic variables. However, according to Taiebnia and Barkhordari (2020), these energy sanctions have also prompted significant reforms within Iran's economy, fostering greater resilience against the negative consequences of the sanctions. Notably, Ali Khamenei, the supreme leader of Iran, underscored the importance of economic resistance against sanctions as a key priority for the country's economy in his speech in 2022. This policy has been viewed as instrumental in promoting economic production and fostering international interactions with countries not subjected to sanctions, offering potential avenues for navigating the challenging economic landscape.

In response to the ongoing Western sanctions targeting its energy sector, Iran has been compelled to reevaluate and redefine its mechanisms and policies to neutralize the adverse effects of these sanctions on its oil and gas industry in recent decades. The sanctions have posed significant challenges, prompting Iran to adopt strategic measures aimed at mitigating their impact and enhancing the resilience of its energy sector in the face of external pressures.

Iran's oil and gas industry has consistently been regarded as a vulnerable point and Achilles' heel by the US and its Western allies, leaving the possibility of ongoing and heightened sanctions in this sector. In response, Iran must employ diverse and effective policies within the confines of existing legal frameworks to neutralize sanctions, alleviate economic pressures, and mitigate adverse impacts on this vital industry.

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3. Research Methodology

The main research method in this paper is Futurology. As mentioned by a pioneer futurologist, Gunnar Andersson (1973), the field of futurology employs various research methods to explore and anticipate future trends and developments. One prominent approach is scenario planning, which holds several advantages in the realm of futurology. Scenario planning involves creating plausible future scenarios by considering a range of uncertainties and their potential outcomes. This method helps researchers and decision-makers understand the potential pathways that the future might take, allowing them to prepare for a variety of possible situations. Alipour et al. (2017) expressed that one key advantage of scenario planning is its capacity to foster flexible thinking and adaptive strategies, as it encourages stakeholders to envision and prepare for multiple future landscapes. Additionally, scenario planning helps identify potential risks and opportunities that might not be evident in traditional linear forecasting methods. By examining various scenarios, individuals and organizations can develop more resilient strategies that can withstand a range of possible future developments.

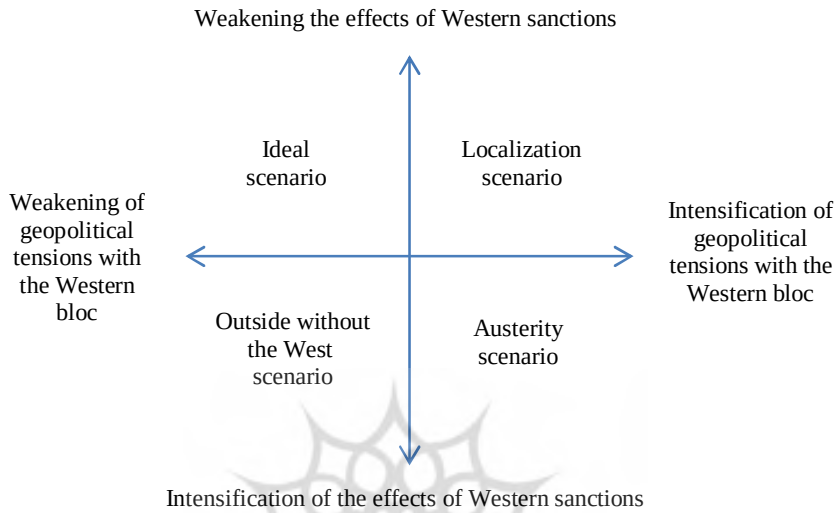
4. Empirical Findings

To assess the effects of sanctions on the energy-related economies of Iran and Russia, the research employs the scenario method. Scenario planning involves creating alternative future scenarios to explore potential outcomes under varying circumstances. By using this method, the study can capture a comprehensive range of possible impacts that sanctions might have on the energy sectors of both countries. Scenario planning is advantageous as it allows for a

more robust understanding of complex and uncertain situations, fostering better decision-making and policy formulation. It encourages flexibility and adaptability by envisioning multiple scenarios, ensuring that policymakers are prepared to address diverse challenges that may arise. Moreover, scenario planning facilitates the identification of early warning signals and triggers, enabling proactive measures to mitigate negative consequences and capitalize on potential opportunities arising from the impact of sanctions on Iran and Russia's energy economics.

When analyzing the impacts of sanctions on Iran and Russia, two significant trends come into focus. The first major trend involves the dynamic interplay between the imposer (Western countries) and the target economies (Iran and Russia), which can either strengthen or weaken the imposed sanctions. This complex relationship plays a crucial role in shaping the effectiveness and longevity of the sanctions' impact on the energy economics of both countries. The second major trend pertains to the geopolitical aspect of Iran and Russia vis-à-vis the US and NATO alliance, particularly in the context of ongoing tensions in Ukraine and the Middle East. Geopolitical factors play a pivotal role in influencing the scope and severity of the sanctions, as well as the responses and strategies adopted by Iran and Russia to withstand the economic pressure and safeguard their energy sectors. Understanding these dual trends is essential for comprehending the multifaceted implications of sanctions on the energy economics of Iran and Russia and their broader implications in international relations and regional stability. Figure 1 expresses the scenarios under the two aforementioned trends:

Figure 1. Futurology of Trends



Source: Authors

The intersection of the two megatrends yields four distinct scenarios. The first scenario, termed the "Localization Scenario", emerges as Western sanctions weaken, and geopolitical tensions with the Western alliance intensify. In response, Iran and Russia embrace localization by leveraging domestic innovation, technology, and knowledge to bolster their petroleum industries. The second scenario, named the "Austerity Scenario", results from the convergence of heightened Western sanctions and intensified geopolitical tensions. These dual challenges compel both nations to adopt austerity policies within their energy sectors, leading to reduced welfare, equality, and an increased risk of corruption. The third scenario, the "Outside without the West Scenario", takes shape when geopolitical tensions ease, enabling Russia and Iran to expand economic and trade diplomacy with Africa, Latin America,

and Asia. This endeavor facilitates the development of their energy sectors by diversifying trade partners beyond Western countries. Lastly, the "Ideal Scenario" emerges as both the effects of sanctions and geopolitical tensions weaken substantially. This favorable combination fosters economic flourishing in both countries, resulting in higher welfare standards and overall well-being within their societies and energy sectors. By exploring these four scenarios, policymakers and analysts gain valuable insights into the potential outcomes based on various levels of sanctions impact and geopolitical dynamics.

In the real world, where national interests play a more important role than economic development for Iran and Russia, determining which scenario is better for Iran and Russia's energy-related economies depends on various factors and perspectives. Each scenario presents unique advantages and challenges, and what might be considered "better" could be subjective based on the priorities and national interests of each country.

5. Conclusion and Policy Recommendations

Over the past 43 years, the American government has consistently pursued a policy of imposing sanctions on Iran. Despite occasional claims of willingness to reduce sanctions and engage in negotiations, the reality has shown that these sanctions tend to intensify and diversify over time. This pattern of continuously expanding sanctions has significantly impacted Iran's economy, primarily due to its heavy reliance on oil sales. Consequently, oil sanctions have remained at the forefront of America's economic warfare against Iran, with little distinction between the approaches of both Republican and Democratic administrations in this regard.

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Sanctions serve as a strategic tool utilized by the US and the Western Bloc to advance their international objectives against countries that impede the realization of these goals. Iran and Russia have both faced various Western sanctions in recent years, and while the initial impact of these sanctions has been detrimental, the two countries have responded at different paces in complying with them. Russia has adopted a "resistance and response" approach against Western sanctions, leveraging its stronger financial markets and robust regional and international network of interactions. In addition to implementing policies such as import substitution and turning towards Asian markets, Russia has also imposed its own sanctions on European and American countries, particularly in the energy sector.

Conversely, Iran, due to financial constraints and geopolitical tensions with neighboring countries, notably those in the Persian Gulf, has adopted a "resistance" reaction. In this context, Iran's resistance economy focuses on bolstering domestic strength through import substitution and increasing influence in non-sanctioning countries' markets. Both countries' responses to sanctions reflect their distinct economic and geopolitical positions, driving them to pursue strategies that align with their respective capabilities and priorities.

Implementing practical policies can serve as a proactive approach for both Iran and Russia to mitigate the adverse effects of economic sanctions. Prioritizing economic integration with non-sanctioning countries offers a viable path for diversifying trade partnerships and reducing dependency on sanctioned regions. Strengthening diplomatic ties and forging economic collaborations with Latin American and African nations can offer new avenues for trade, investment, and technological exchange. Moreover, directing

efforts towards securing shares in the East Asian fossil fuels market could provide a stable demand base and counterbalance the impact of restricted access to Western markets. Concurrently, enhancing economic diplomacy capabilities can aid in negotiating favorable terms, securing investments, and navigating global relations adeptly. By adeptly leveraging their geopolitical significance, Iran and Russia can position themselves to derive greater economic benefits from both regional and global partnerships, thereby offsetting the detrimental ramifications of economic sanctions.

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