The Relationship between Sanction and Supply Chain of Strategic Commodities in Iranian Offshore Oil and Gas Industry: Case study of SADRA company

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ABSTRACT

Oil and gas industry of Iran is one of the most essential industries of the country in the field of supplying costs and budget. For this reason, petrochemical products are the main sources of income in Iran. Meanwhile, in Iran, What is more affected many domestic manufacturers is imposing sanctions as an external factor in the fields of supplying raw materials and components, sales of products to some customers, transportation of products, insurances of ships, and foreign exchange transfers. In this study we aim to examine the relationship between sanction and providing strategic commodity in Offshore Oil and Gas Industry. This study conducted in SADRA Company in Iran. Accordingly, nine variables of research and development, production, purchasing, logistics, information systems, financing, customer service, forecasting, and structure were investigated. Participants composed of 100 managers and 700 experts, and data collection tool was a questionnaire. The obtained results were analyzed in SPSS software. Our findings showed that all of nine variables had significant impact on sanctions, so we concluded that there is a relationship between sanctions and supply chain of strategic commodities in offshore oil and gas industry projects.
KEYWORDS: sanctions, strategic commodity, Offshore Oil and Gas Industry, survey study

1. INTRODUCTION

Today, oil and gases, especially petrochemical products are the main sources of income in Iran. Billions of dollars of investment in Iran have been used for construction and development of new units of oil, gas, and petro chemistry. So, considering the critical situation of Iran in the region and intense competition with countries like Qatar in the fields of oil and gas industry or with Saudi Arabia in the fields of petro-chemistry, careful management of such projects, and the completion and commissioning of these projects faster and with higher quality seems necessary(Madadi and Mokhtar, 2005). Some factors such as an increase in the exchange rate and the difficulty of providing materials and components from abroad have overshadowed the domestic suppliers in Iran. This has a more negative effect on materials and components that were supplied from domestic or foreign sources (Eghtedarian and Ahmadi, 2012). Sanction is of high importance from another aspect, and its effects on the enforcement of contracts, particularly trade-international contracts seem relatively complex. Imposing different degrees of sanctions makes implementation of commitments difficult or impossible for companies (Ebrahimi and Oyarhossein, 2012). Experiencing six periods of sanction in the Islamic Republic of Iran after the Islamic Revolution shows that sanctions have influenced many industries of Iran especially the oil industry, because it is one of the most basic economic sectors. Undoubtedly, important measures have been taken in different industries especially oil industry of Iran for coping with theses sanctions. Since such environment especially political environments are so varied and dynamic, continuous and permanent monitoring and immediate changes in strategies and programs are some necessary measures. Therefore, it is necessary to analyze the oil industry in Iran in recent situations of sanctions and offer some strategies based on this analysis for finding possible alternative (Moazami and Sorati Ashtiani , 2012).

Today, in Iran, the greatest running projects are related to oil and gas, and petrochemical projects. By taking a brief glance at the state of income in Iran in 2004, we will realize that Over 80% of income in Iran have been supplied by selling oil and its other products. Thus, managing running projects seems necessary to complete them as soon as possible, and reach the production stage (Madadi and Mokhtar, 2005).

It should be noted that hydrocarbon resources are as a two-edge knife which can be used as a lever of pressure by both sanctioned and sanctioning countries. This is more accurate about a country with high hydro-carbonic potential such as Iran. Iran's dependence on foreign exchange earnings from oil exports, and its technological

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dependence on new technologies of foreign international companies in terms of exploration, development, and production of fields have resulted in imposing sanctions on its oil and gas sector as a vulnerable sector of its economy. Despites the considerable guaranteed benefits from investment, and participation in the projects of oil and gas sector in Iran, International sanctions against Iran have reduced investors' motivation by increasing transaction costs and uncertainty in the investment environment (Sayadi and Bereshki , 2012).

Besides bargaining and putting pressure on the oil major customers such as Europe and India to reduce or stop purchasing Iranian oil, sanction on Iranian oil are imposed by putting pressure on insurance companies to abandon their cooperation with Iran in terms of issuing insurance coverage for oil tankers. It seems that the amount of Iranian oil production has been influenced due to the speed of putting these pressures, continuity of constant pressure put by the United States on buyer countries, and the short-term opportunity of Iran to replace new buyers. Scattered reports of declining oil production have been released by international energy organizations such as OPEC. Such reports have never been officially confirmed by Iran. In case of the accuracy of this data, the decline in production has been accelerated since the beginning of the 2011 till now in comparison with the year 2010. As the foregoing suggests, realistic observation of the status quo can play an important role in achieving solutions to resolve and passing the current circumstances considering the intensification of sanctions against Iran and particularly the oilembargo of the past year. Conducting a comprehensive research on sanctions from the financial and contractual impacts to supply of materials and commodities can be efficient in presenting appropriate alternatives.

Although, the previous researches conducted on this area have taken steps towards identifying challenges and recommending some solutions, it is required to carry out a comprehensive research to investigate sanctions and the related effects, and present an appropriate alternative for reformations. For this purpose, this study attempts to examine the structure of commodity supply chain before that the sanctions were put against Iran, and the impacts of sanctions on time delay of projects, cost price of commodities, organizations reactions, the method of commodity supply, customs affairs, and contract terms, and investigate the possibility of using the previous structure of commodity supply and its efficiency or the existence of an appropriate alternative.

2. MATERIALS AND METHODS

2.1. Sanctions

Different views and definitions of the sanction have been provided by various social scientists, but no agreement has been reached. According to political dictionary, the term sanction means allowing, authorizing, penalties, fine, and official permission. In Encyclopedia Britannica, it has been written under the entries "sanction" and "guarantee" that they are used in international law by the collective efforts of governments to ensure the rules and regulations of international law and it may begin from the admonitory and critical judgments of government against other governments, and result in economic sanction or use of military forces. Elsewhere, sanction means official permission, penalties, or political, economic and military punitive measures which are taken by collective security system against violators of international law (Dargahi, 2012). Sanctions as tools of providing political interests for a country are placed in the middle of a range which its lower limit comprises the most difficult coercive measures such as the use of military force, and covert operations or threat of force, and its upper limit comprises diplomatic measures, the expulsion of diplomats, summoning the ambassador, official diplomatic protest, and suspending cultural exchanges. In other words, sanctions are in the middle of this range (Carter, 1988). Economic sanction is a kind of coercive diplomacyin which a mixture of force and diplomacy is purposefully used to make the enemy, who intends to change the status quo or has changed it just now, to revise his decision(Alexander and Simons, 1994).Influencing the policies of a country or even changing its system and imposing punishment on a country are the common reasons which are presented in the definition of the entry "sanction". Sanction can be defined as the following:

- tools of symbolic opposition to the policies of the sanctioned country
- destabilizing the targeted country
- reducing the military of a country
- supporting from the right of human, facing with terrorism, and preventing from proliferation of weapons of mass destruction
- sanctions to deter the sanctioned country from pursuing some unpleasant policies in the future
- Proving the determination of sanctioning country in terms of pursuit of national interests. (Lopez and Cartwright; 1995; Behrouzifar , 2006; Aziznejad and Seyed Noorani, 2009).

From the viewpoint of international law in the field of sanctions applied by one country against another, there are three different theories: (Aziznejad and Seyed Noorani, 2009)

(a). *Theory of sovereignty:* Emer de Vattel(1714-1767), Swiss philosopher, legal expert, and diplomat, is one of the theorists in relation to the theory of sovereignty, and states that since countries have sovereignty, they can act freely in terms of setting their external relationships with other countries and give priority to their duties and tasks which a government has towards its own country rather than the duties of the same government towards the other countries and international society.

(b). *Theory of legal restrictions:* this theory, which is largely influenced by the theory of classic liberal economic-political theory, does not permit applying not only secondary sanctions but also primary sanctions. Classical-liberal political economists are advocates of free-trade. So, they believe that any intentional and deliberate disturbance in the normal course of business transactions damages to the world economy.

(c). *Neutral approach:* neutral approach is relatively similar to both above-mentioned theories. According to this theory, direct economic war on another country is permitted, and as a result, harmful effects on third parties are minimized. Neutral approach authorizes what is known as primary sanctions, but considers some limitations for the secondary ones.

However, according to the theory of sovereignty, there is no considerable difference among the various degrees of sanctions, and every country is allowed to refuse having relationship with other countries due to any specific reason (Zahraei, 1997), the primary responsibility for maintaining international peace and preventing from the spread of weapons of mass destruction specially nuclear weapons and fighting against terrorism has been assigned to the Security Council as the most important element of the United Nations by virtue of Chapter VII of U.N. Charter, and in this regard, the right of applying sanction as civilian tools has been given to the Security Council. The commitment of Security Council to the principles of general international law requires three important principles including the principles of being human, necessity, and proportionality. The principle of being human includes several examples. Article 2 of the Third Geneva Convention of 1949 has given some of such examples about the rights of the prisoners of war, which are: Personal comfort, health, appropriate place to live, adequate and nutritious food, access to adequate drinking water, clothing, medical care, the right to perform religious rituals, the opportunity to carry out intellectual, educational, activities and recreational activities, and sports and games. David Sons (2003) believes that by accepting the fact that the principle of necessity as is applicable age neral principle of law in relation to the Security Council actions, it is concluded that any *violation of human rights,* which is reasonably predictable due to such actions, should be considered necessary to achieve the legitimate objective. For example, if the international travel ban or restriction on persons residing in the sanctioned country is agreed as a part of civil enforcement actions, it should become obvious that such restrictions on the rights of the citizens is necessary to achieve the legitimate objective of the aforementioned actions. The principle of proportionality requires that the sanctions ensure an appropriate response to the behavior of sanctioned country. Therefore, benefits of the sanction should be more than its losses. The principle of proportionality is related to the necessity. It is said that the limitation should be in accordance with the necessity or a higher profit by which the limitation is supported(Chowdhury, 1998).

2.2. The effects of sanctions on the implementation of oil and gas international contracts

Sanction influences the implementation of international contracts, and the different aspects of a project or bilateral contract (Ebrahimi and Oyarhossein, 2012).

i. The impact of sanction on the increase in cost (Cost): the primary cost resulting from sanction is allocated to time and energy spending for financial and commercial relations. This cost is imposed on both sides according to their statuses. Market change is along with temporal and financial costs as well as cost price. In situations where the market changes due to the sanction, inevitably, the same product is purchased by a higher price. So, purchasing power is decreased, and lead sanctioned countries to lose their selling market. The other cost is ranking the risks of the targeted country. Increasing or decreasing the risks results in an increase or decrease in costs of transactions. One another cost is a psychological one that causes investors to have doubt about the investment opportunities. Naturally, transaction among countries is in a way that the buyer demands for the best and the most adequate product with the lowest price, and the seller also exports the best product. When the sanction begins, an artificial diversion is established in trade relations of both importing and exporting countries and the economic costs increase for both of them. Generally, the economic relationships are damaged, but, the amount of increase in costs in the sanctioned country is related to the amount of its dependence to the sanctioning country.

ii. The impact of sanction on the prolongation of the projects implementation (time): the cost prices of productions increase due to the sanctions, goods are not sent and services are not provided. In this case, it is likely that the time-durations of projects implementations become prolonged due to lack of timely payments of the prices of goods resulting from sanction.

iii. The impact of sanction on the quality and services (quality): quality control cannot be accomplished in accordance with technical procedures approved by the standards accepted by the project manager. Thus, goods and

services are not satisfactory standard, and their qualities are increased due to the lack of supervision, quality control, and process control related to the transport of goods.

iv.   The impact of sanction on the possibility of lack of achieving the quantities of the project (quantity): the required good cannot be purchased from the considered seller considering the sanction. So, there will be a need for replacing goods. Therefore, we had to change the technical specifications, and the scope of the project.

v.   The impact of sanction on the lack of realization of project objectives (objectives): if the project objectives are not achieved, the nature of the contract will be questioned. In such situations, risks should be controlled, and risk management and the related topics should be discussed. It is likely that the lack of realization of project objectives leads to the termination or cancellation of the contract (Ebrahimi and Oyarhossein , 2012).

Measures including economic sanctions imposed by the European Union as a part of its foreign policy can be given as examples in the field of sanction effect on the implementation of international contracts. The European Union uses economic sanctions as a tool for changing the political behaviors of the targeted countries (Eeckhout, 2011). This union has imposed different economic sanctions against several countries including Belarus, Democratic Republic of the Congo, Ivory Coast, Haiti, Burma, Sudan, Zimbabwe, Libya, Syria and Iran. The recent case of the economic sanctions is the resolution which was adopted by the European Union in January 23, 2012. International studies show that Iran is one of the few countries which its oil and gas industry has been so much sanctioned. The reason for change in west's sanction policy towards oil and gas industry is the Iranian economy independence on this industry and its invulnerability due to its independence on technology and foreign capital (Arian Kian, 2012). In the process of sanction against countries, some pointes which are mentioned in the resolution are:

•   a ban on the crude oil import from Iran

•   sanction on insurance coverage and financial resources related to the crude oil import

•   sanction on petro-chemistry and investment in this area

•   sanction on the central bank including freezing the assets of central bank in the territories of the states of the Union

•   sanction on sensitive commodities with dual application

•   the sanction lists of the individual should be extended in comparison with the previous resolutions(Council Regulation, 2010)

It is about one decade that besides the multilateral international efforts to prevent Iran's nuclear activities, the European Council has imposed unilateral economic sanctions against Iran in response to continuing noncompliance with its nuclear obligations (Calamita,2009). Sanctions targeting Iran's oil and gas sector have considered some punishments for the companies which help to develop different activities of oil and gas industry of Iran. In accordance with the aforementioned sanctions, Violation of The Comprehensive Iran Sanctions, Accountability, and Divestment Act of 2010 (CISADA) regulations will result in imposing some punishments on companies and individuals including:

•   Investing 20 million dollar or more over a period of 12 months which leads to an increase in investment ability of Iran to develop its petroleum resources. petroleum resources comprise crude oil, refined petroleum products, oil tankers or liquefied natural gas , and products that are used to build or to protect from pipelines that transport petroleum products

•   Providing or selling refined petroleum products with a value of one million dollar in each contract or 5 million dollar over a 12-month contract to Iran. Petroleum products include jet fuel, gasoline and aviation gasoline.

•   Providing, selling or leasing goods, services or other supports which make the maintenance and development of refining capacities to develop. In accordance with the Article 23 of CISADA adopted by EU sanctions in July 2010, member states of UN should ban selling, supplying or transferring any key equipment or technologies as well as financial and technical assistances which can be used in key parts of oil and natural gas industry of Iran. In addition, member countries should ban new investments in the above-mentioned sectors.

2.3. Sanctions as the most fundamental disruption in supply chain

Many studies have been conducted on sanction such as Charnovits (2001), Eyler(2007), and William and Anton (1988). The first concept of sanction which comes to mind is to ban or limit the exports and imports, but this is only its primary and immediate effect, and after a while, the other effects of sanction including financial effects will be observed. Such effects lead to restriction on banking transactions and monetary transfers. In such circumstances, organization are not able to do their international financial affairs as same as before, and have to buy financial credit instead of cash. Moreover, In the long run, additional problem is developed in supply chain which is the same imposing restriction on the external companies in terms of cooperating with the sanctioned country resulting in preventing such companies from cooperation and investment (Zegordi and Davarzani, 2011). Table 1 present different levels of sanction.

Table 1. Describing the effectiveness levels of sanction (Zegordi and Davarzani, 2011)

• **Disconnecting the cooperation with external organizations** • **Imposing restriction on external investment**	**Long-term effects(restriction on investment)**
• **Creating problem in terms of approving credits** • **Creating problem in terms of banking transactions and monetary transfers** • **Creating problem in terms of opening credit**	Middle-term effects(credit and monetary effects)
• **Imposing restrictions on the exports and imports** • **Preventing from international cooperation** • **Prohibiting the freight of Iranian shippers and transportation fleet**	Immediate effects(trade restrictions)

One of the specific features of sanction is that it is unpredictable. Sanction occurrence does not have any constant and pre-determined probability which can be planned simply, because the probability of sanction occurrence under normal condition and before the development of a political problem is very low and approximately equal to zero. Therefore, due to extremely low probability of sanction occurrence under normal condition, organizations are not reluctant to invest in alternative ways (Zegordi and Davarzani, 2011).

2.4. Supply chain and its components from the perspective of experts

Supply chain can be defined as a chain which contains all the activities associated with the flow and transformation of commodities from raw material procurement to final delivery to the customer. This chain starts with the extraction of raw material procurement and ends with the final delivery to the customer (Rahimifard and Nakhaei, 2008). Figure 1 shows the structure of supply chain.
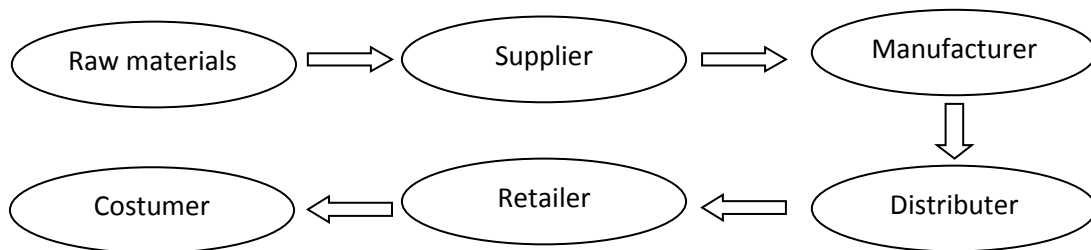
Figure 1. The structure of supply chain

Considering the importance of supplying and producing strategic commodities in oil and gas industry, the ability to production and production rate are of high importance and every manufacturer who has a greater share in the production of such commodity will have a greater share in the global market. According to Mentzeret al (2001), supply chain means strategic and systematic cooperation of companies' trading activities and the use of some strategies in trading activities to improve long-term performance of companies and the entire supply chain. According to him, supply chain can be demonstrated with a more comprehensive view which is shown in Figure 2.
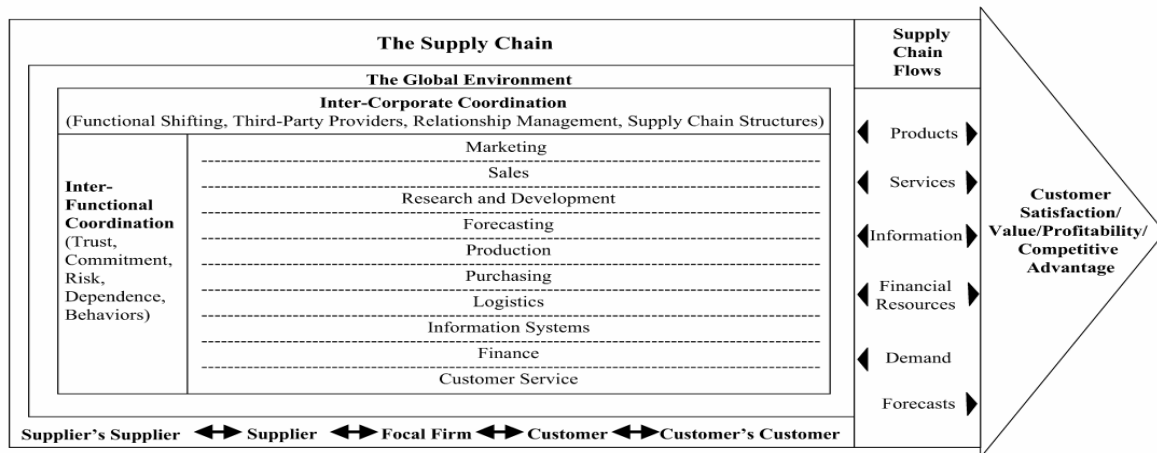
Figure 2. Supply chain model according to Mentzer et al (2001)

2.5. Previous works

Numbers of researches have been conducted on the supply chain, and strategic commodities in national and international level. some examples are presented in the following.

Rezaeian et al (2009) conducted a research on designing a model for organizational transformation in supply chain cost management of Iran Khodro Industrial Group in Iran. to do this, he investigated supply chain of the company, and in this regard, cost management was paid attention with the aim of attracting customers' satisfaction, and maintaining profit margins (Rezaeian et al, 2009). Eghtedarian and Ahmadi (2012) examined the development of strategies associated with the suppliers of Khuzestan Steel Company in Ahvaz, Iran to reduce risk, and noted that the development of competitive business environment has turned the supply chain into a key challenge in terms of organizations' supply chain management. In addition, the occurrence of international sanctions as the major driver for risk has increased the risk of the supplying materials and components for several organizations in Iran by affecting exchange rate, and modes of transportation and payment. Accordingly, categorizing suppliers and adopting new strategies for communicating with them are considered as necessary measures to reduce supply risk. Eghtedarian and Ahmadi (2012) categorized suppliers using the approach of reducing supply risk in Khuzestan Steel Company in Ahvaz, Iran as a case study (Eghtedarian and Ahmadi, 2012).

Bagheri et al(2011) investigated the factors affecting the performance of supply chain in terms of purchase unit, procurement, and commodity affairs in National Iranian South Oil Company due to the importance of the role of supply chain. They studied a statistical population comprising of 150 managers and supervisors of National Iranian South Oil Company. Based on the experts' points of view, the effective factors were the supplier, time, process, cost, and flexibility (Bagheri et al,2011) . Rajabzadeh Ghotri et al(2010) developed a model for risk factors affecting electronic supply chain and its impact on organizational performance, and said that organization are always trying to improve their market shares, increase their profits, and achieve competitive advantage over their competitors. They noted that paying attention to the efficiency and effectiveness of supply chain is of great importance in every organization, and the uses of e-commerce, and information and communication technologies have enabled organizations to be responsible and flexible in relation to the changing needs of the market. E-commerce has fundamentally changed the structure of supply chain. They identified these risk factors to develop a model for risk factors affecting electronic supply chain, and investigating the effects of such factors on financial and non-financial performance of the organization, and explored the effect of electronic supply chain risk on the performance of active organization in the field of telecommunication and electronics by evaluating the appropriate financial and non-financial performance indicators. In this regard, correlation and structural modeling suggest that identifying and managing electronic supply chain risk has a great influence on the organization performance (Rajabzadeh Ghotri et al, 2010).

Kleindorferand and Saad (2005) presented a conceptual model for estimating and reducing disruptive risks in supply chains, and provided some guidelines for management of such risks using data collected from the United States oil and gas industry. According to them, there are two broad categories of risks which influence management and supply chain design, the first category of such risks arises from the problem of coordinating supply with demand, and the latter arises from disruption in normal activities. In the current study, the latter type of the above-mentioned risks arising from natural disasters, strikes, economic problems, and the performance of powerful factors such as terrorists is examined. Kleindorferand and Saad (2005) presented a conceptual structure, which represented the common activities for assessing and eliminating risks, and played a significant role in supply chain risk management. Then, they considered experimental results related to the data set collected from the U.S. Chemical Industry in the years between 1995 and 2000, and discussed the applications of managerial system design to cope with the disruptive risks in supply chain based on the obtained results and other researches. They suggested that the disruption caused by the accident in the petrochemical industry lead to economic losses and environmental damages. These evidences indicated the importance of paying attention to the disruptions by all the beneficiaries. Lee and Wolf (2003) proposed some strategies for reducing the damage of loss of security which cause disruption in the supply chain. According to them, managers of supply chain are faced with a two-way street that how to improve their security without disrupting supply chain. The answer lies in the principle of quality movement. Quality management teaches us that we can have security or reduce the effects without increasing the costs. We are able to develop some strategies which prevent from political gaps and eliminate them, and at the same time, increase productivity and profit. Norrman and Jansson (2004) conducted a case study on the effect of a fire at a sub-supplier of Ericsson Company. Their research demonstrated that how Ericsson Company changed its method for the supply chain risk management after that a fire was occurred as a disruption. They noted that supply chain risk management is of a significant importance, because it increases the vulnerability of supply chain. The diving factor of their research was to describe that how an organization can present a procedure or tool for supply chain risk management by exemplifying Ericsson Company after the occurrence of fire at a sub-supplier which had a significant effect on

this company. The descriptive approach of their research attempted to analyze and manage supply chain risk management by a close cooperation with the suppliers, and imposing official requirements on them. This descriptive analysis illustrated that insurance companies should turn into a driving force for a better supply chain risk management, because the vulnerability of modern supply chain was perceived well. Their research ends with a discussion on the risks associated with traditional logistics concepts (i.e. time, cost, quality, skill, and defect), and a suggestion that when assessing new logistic solutions, supply chain risks should be analyzes not only with the aim of minimizing the risks but also by attempting to find the efficient level to prevent from risk.

2.6. Case study

SADRA also known as "Iran Marine Industrial Company" was founded in 1968 as a small ship repair yard in Bushehr, Iran. Since then, SADRA has established itself as the leading shipbuilding and ship repairing company in Iran. SADRA is also active in offshore oil & gas development. SADRA specializes in building ships, docks and floating oil rigs.

2.7. Research method

In terms of methodology, this is a survey study, and both field and library studies were conducted to collect data. The research-made questionnaire was used as data collection tool. This tool had 31 questions according to different components of supply chain and based on 5-point likert scale.Also, Delphi technique, and Cronbach's alpha were respectively used to assess the questionnaire validity and reliability. The statistical population was comprised of about 700 experts and 100 managers in the SADRA Marine Industrial Company, Iran. Random sampling method using Cochran formula was used to select study sample. Accordingly, a sample size of 320 was selected. The components of supply chain are independent variables, and sanction is dependent variables.Kolmogorov – Smirnov test was used to examine the normal distribution of data. Correlation coefficient is the test of being fitness with the structures of correlation hypotheses. Due to the lack of ordinal assessment of variables, and their non-normal distribution, it would be better to use non-parametric tests. In this regard, Spearman's correlation coefficient is one of the best tests. So, Spearman's test and SPSS were used to analyze data

3. RESULTS AND DISCUSSION

3.1. Descriptive statistics

In this section, descriptive statistics of variables and demographic characteristics of participants are presented based on data collected from 320 managers and experts.

Table 2. Demographic characteristics

Measure	N	%
Sex group		
Male	224	76.2
Female	76	23.8
Total	320	100
Age group		
30-35	75	23.4
36-40	85	26.6
41-45	60	18.8
46-50	52	16.3
More than 50	48	15
Total	320	100
Educational level		
Bachelor	160	50
Mater	97	30.3
PHD	63	19.7
Total	320	100
Work experience (years)		
Leas than 10	81	25.3
10-15	82	25.6
16-20	57	17.8
21-25	61	19.1
Higher than 25	39	12.2
Total	320	100

Table 3. Mean and standard deviation of research questionnaire items

Variable	Mean	SD
The state of sanction in terms of the supply of offshore oil and gas projects strategic commodities	3.9125	.71603
Research and development in field of finding new suppliers	2.4563	.76233
Research and development in the field of internal production	2.2937	.83119
estimating the cost price of the projects productions(time of holding tender)	2.1156	.69192
Estimating time schedule of the projects delivery(time of holding tender)	2.1906	.90863
Estimating the rate of demands for the projects commodities	2.0031	.71482
Increasein the time of the projects implementations	3.8438	.65817
Increasing in the response time and giving idea about the supplier's technical document	3.8937	.62944
Increasein the official and personnel costs	3.9313	.63465
Decrease in organizational efficiency	2.8063	.61839
Decrease in human resources productivity	2.7250	.70777
Reducing the commodities qualities	3.6375	.69017
Increasing in engineering and project design costs	3.5906	.73721
rates and volumes of commodities productions	3.6688	.68318
The terms and conditions of the contract payment	3.8750	.66953
The amounts of international contracts terminations	3.8000	.62146
Increasing projects legal risks	3.8000	.65102
Disruption in providing bank guarantees	3.7250	.66672
Increase in shipping costs	3.7438	.63094
Increase in insurance rates	3.5750	.80008
Increase in storage costs	3.5000	.84912
Increase in the time of shipment from the major manufacturer to the factory	3.4625	.76677
Using e-commerce	2.4688	.70752
Transferring information between the buyer and the seller	2.3719	.64993
Possibility to use external banking facilities(e.g. documentary credit, transfer, exchange, and warranty)	2.3031	.61740
Providing liquidity and external investment	2.3625	.76758
providing after-sale services	2.2781	.70432
Supply of spare parts	2.3531	.76584
Manufacturer' cooperation in installation and launching	2.4219	.76778
Restructuring the supply chain	3.6094	.72174
Restructuring the supply chain(from the form of supply through the manufacturer into the form of supply through the intermediary	3.6094	.72174

According to table 3, mean and standard deviation values of the variables related to sanction and supply of strategic commodities in the offshore oil and gas industry are calculated. Accordingly, as it can be observed, considering the five-point Likert Scale of items ranging from very low to very high, the mean values of variables "Estimating time schedule of the projects delivery"," Estimating the rate of demands for the projects commodities", "Decrease in organizational efficiency", "Decrease human resources productivity", "Using e-commerce", "Transferring information between the buyer and the seller", "Possibility to use external banking facilities", and " providing after-sale services" are between 2 and 3 during sanctions. It means that in case of a sanction, the mean values of these items reduce considerably. The mean values of other variables are between 3 and 4,whichwe can say that components of (1) research and development, (2) production, (3)purchasing, (4)logistics, (5) information systems, (6) financing, (7) costumer service, (8) forecasting, and (9) structure are important factors in sanctions and providing strategic commodities.

3.2. Inferential statistics
3.2.1. Testing data distribution
The Kolmogorov - Smirnov test is used to assess the normality of the data distribution.In interpreting the results, if the significance value (sig value) is higher than the probability of error value (p value=0.05), there will be a normal distribution, but if it is not so, there will not be a normal distribution.

Table 4. Kolmogorov – Smirnov test results of study variables

	K-S	Sample size	Sig	error level	result
Sanctions	4.392	320	0.000	0.05	Non-normal
Research and development	4.011	320	0.000	0.05	Non-normal
Forecasting	4.011	320	0.000	0.05	Non-normal
Producing	2.962	320	0.000	0.05	Non-normal
Purchasing	4.428	320	0.000	0.05	Non-normal

Logistics	4.132	320	0.000	0.05	Non-normal
Information system	5.041	320	0.000	0.05	Non-normal
Financing	4.937	320	0.000	0.05	Non-normal
Customer services	2.813	320	0.000	0.05	Non-normal
Structure	5.135	320	0.000	0.05	Non-normal

As it can be seen in table 4, considering the K– S statistic value and sig value, it can be said that there is a significant difference between the observed distribution and the expected one for all the above-mentioned variables. Therefore, variables have a non-normal distribution, and non-parametric tests should be used to examine research hypotheses.

3.2.2. Testing research hypotheses

In this section, first, Spearman correlation is used to test the relationship between two variables. Then, the relationship is interpreted.

Hypothesis 1: there is a significant relationship between sanctions, and research and development of strategic commodities in offshore oil and gas industry.

Table 5. Spearman correlation test results of H1

Model	Variables	Statistic	P-value	N.
1	sanction, and research and development of strategic commodities	-0.226	0.000	320

According to table 5, the relationship between the sanction, and the research and development of strategic commodities in offshore oil and gas industry has been evaluated based on the opinions of 320 experts. As it can be seen, considering the Spearman correlation coefficient(r_s=-.0226), and p-value which lower than 0.05,it can be said that the relationship between sanction, and research and development of is significant at 99% confidence level. In other words, the null hypothesis is rejected, and the researcher's hypothesis is conformed. So, research and development has effect on sanctions 22%.

Hypothesis 2: there is a significant relationship between sanctions and forecasting strategic commodities in offshore oil and gas industry.

Table 6. Spearmancorrelation test results of H2

Model	Variables	Statistic	P-value	No.
2	*Sanction and forecasting strategic commodities*	-0.802	0.000	320

According to table 6, based on the spearman correlation coefficient value, which is equal to -0.802, and p-value of less than 0.05, it can be found out that there is a significant relationship between sanction, and forecasting at 99% confidence level. Also, correlation coefficient between these two variables indicates that the relationship between them is strong and in negative direction. In total, we can say that forecasting explain80% of variations in sanctions.

Hypothesis 3: there is a significant relationship between sanctions and production of strategic commodities in offshore oil and gas industry.

Table 7. Spearmancorrelation test results of H3

Model	Variables	Statistic	P-value	No.
3	*Sanction and production of strategic commodities*	0.689	0.000	320

Based on the table 7, spearman correlation coefficient (r_s= 0.689), and p-value=0.000, which is lower than 0.05, so it can be concluded that there is a significant relationship between Sanction and production of strategic commodities at 99% confidence level, an the correlation between them there is strong and in positive direction.In other words, production explains69% of variations in sanctions.

Hypothesis 4: there is a significant relationship between sanctions, and purchasing strategic commodities in oil and gas industry.

Table 8. Spearmancorrelation test results of H4

Model	Variables	Statistic	P-value	No.
4	*Sanction, and purchasing strategic commodities*	0.751	0.000	320

Based on table 8, with respect to spearman's correlation coefficient (rs=0.751), and p-value which is lower than 0.05, we can say that there is a significant relationship between sanction, and purchasing strategic commodities at 99% confidence level. Also, the relationship between them is strong and positive, and purchasing explains 75% of variations in sanctions.

Hypothesis 5: there is a significant relationship between sanctions and logistic of strategic commodities in offshore oil and gas industry projects.

Table 9. Spearmancorrelation test results of H5

Model	Variables	Statistic	P-value	No.
5	*Sanction, and logistic of strategic commodities*	0.487	0.000	320

As it can be seen in table 9, r_s=0.487, and sig.=0.000 < 0.05, so it can be concluded that there is a significant relationship between sanction, and logistic of strategic commodities at 99% confidence level, and the correlation between them is strong and in positive direction. In total we can say that say, logistic can explain 49% of variations in sanctions in offshore oil and gas industry projects.

Hypothesis 6: there is a significant relationship between sanctions and information systems of strategic commodities in offshore oil and gas industry.

Table 10. Spearmancorrelation test results of H6

Model	Variables	Statistic	P-value	No.
6	*Sanction, and information systems of strategic commodities*	-0.248	0.000	320

Based on table 10,considering the spearman's correlation coefficient(r_s=-0.248), and p-value <0.05, it can be stated that there is a significant relationship between sanction, and information systems of strategic commodities in offshore oil and gas industry projects at 99% confidence level, but it is weak and in direction. In total, information systems can explain about 25% of variations in sanctions.

Hypothesis 7: there is a significant relationship between sanctions and financing in offshore oil and gas industry.

Table 11. Spearmancorrelation test results of H7

Model	Variables	Statistic	P-value	No.
7	*Sanction and financing*	-0.287	0.000	320

Based on table 11, r_s=-0.286 and p-value < 0.05 , it can be stated that there is a relationship between the variables" sanction", and "financing" at 99% confidence level. So it is a weak and negative correlation. Financing can explain29% of variations in sanctions.

Hypothesis 8: there is a significant relationship between sanctions and customer services in offshore oil and gas industry..

Table 12. Spearmancorrelation test results of H8

Model	Variables	Statistic	P-value	No.
8	*Sanctions and customer services*	-0.540	0.000	320

According to table 12, with respect to spearman correlation coefficient value(0.540), and p-value (0.000), there is a significant relationship between sanction, and providing services for customers in offshore oil and gas industry at 99% confidence level. In addition, the correlation between them is average and in negative direction. Finally it can be said that customer services explain 54% of variation in sanctions.

Hypothesis 9: there is a significant relationship between sanctions and supply chain restructuring in offshore oil and gas industry.

Table 13. Spearmancorrelation test results of H9

Model	Variables	Statistic	P-value	No.
9	*Sanctions and supply chain restructuring*	0.329	0.000	320

Based on table 13, we can also conclude that there is a relationship between sanctions, and restructuring supply chain of strategic commodities in offshore oil and gas industry projects at 99% confidence level, and structure can explain 33% of variations in sanctions.

4. Conclusion

Nowadays, oil has turned to a strategic and critical commodity for the continuity of west's industrial life, and its value has not been reduced even by the advent of new energies. Therefore, due to the various distribution of oil in the ground, dominating the oil resources has turned into a top priority of great powers to still remain as the great powers of the world by dominating the production, distribution, and consumption of oil. Iran as an influential power in the Middle East has huge reserves of oil and gas. For this reason, major powers of the world attempt to make Iran miss the opportunity to develop by finding different ways, and create barriers to Iran to make it not to be innovative in the field of energy resources by taking some measures such as imposing sanction. For this purpose, in this study,

the relationship between sanction, and supply chain of strategic commodities in offshore oil and gas industries in Iran was investigated. According to participants, 9 components of research and development, production, purchasing, logistics, information systems, financing, customer service, forecasting, and structure were effective factors in sanctions and providing strategic commodities in offshore oil and gas industry projects, so we examined their relationship in the form of 9 hypotheses in SPSS software. Our findings showed that all of ninevariables had significant impact on sanctions, so we concluded that there is a relationship between sanctions and supply chain of strategic commodities in offshore oil and gas industry projects.

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