THE IMPACT OF SANCTIONS ON OIL INDUSTRY PERFORMANCE

(CASE STUDY: MAHSHAHR PETROCHEMICAL COMPANY)

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ABSTRACT

The purpose of this research was to investigate and identify the impact of sanctions on the performance of the petrochemical industry in Mahshahr area. This is an applied research in terms of the objective and a survey-correlational study with regard to the implementation. Our statistical population included all the employees (n = 1850) of the petrochemical industry in Mahshahr region. A total of 318 subjects were selected according to the sample size formula. A cluster sampling method was used as there are about 19 petrochemical companies in Mahshahr petrochemical region. The research scale was a questionnaire for the sanction impact on the performance of the petrochemical industry. A reliability of 0.76 was obtained for the questionnaire according to the Cronbach's alpha coefficient. Data were analyzed byone-sample t-test. The research findings indicate that sanctions could affect the performance of the petrochemical industry and its components (management, marketing, realization and development, and production performances). The results show that the sanctions have had a significant impact on the petrochemical industry, the export of which significantly decreased from 2009 to 2015according to the Customs' report as a result of sanctions on the petrochemical industry.

Keywords: *Sanctions, Marketing Performance, Production Performance, Petrochemical Industry.*

INTRODUCTION

The intensification of the Iranian oil industry boycott with the aim of depriving the country of oil revenues and forcing it to cooperate with the global community has begunmore than a year ago to rectify the ambiguities about a probable nuclear program. Obviously, realistic observation of the status quo can play a very important role in achieving solutions to overcome the current situation. The following survey, therefore, tries to provide a synoptic list of the consequences of imposing sanctions on the Iranian oil industry. It should be noted that the impact of sanctions is certainly not limited to the ensuing cases.

According to some reports, there is a huge gap between the predicted program and the actual production performance as a result of the sanctions and dropped purchases of Iran's oil. Accordingly, the revenues from crude oil saleshas fallen for both the country and the National Iranian Oil Company (NIOC). This decline is more pronouncedin the investment sector on oil projects. A huge amount of investments made by the NIOCis currently being carried out in South Pars.The repayment of financial obligationshas imposed an immense pressure on the financial structure of the NIOCresulting from failure of phases to reach the production stage. Failure of revenue return from the production and use of these resources in ongoing projects are among the bottlenecks of NIOC in the rapid development of this shared field. If reformed, this issue

could have had a significant role in improving the workflow until full development of this field. Given the current situation, even if ongoing projects are successful despite the high cost and time, it will beinevitable to choose between the lack of production from these fields, or reduction of production from other fields.

The sanctions on the sale of certain itemsand also on trade with Iran have led to many problems in supplying lots of essential goods for the oil industry. Moreover, even in the event of circumvention of the sanctions, important items that are not sometimes of modern technology becomeavailable to the projects with more costs in longer periods. In some cases, however, the required goods were virtually unavailable leading to a recession of projects, which is well visible in highly prioritized projects. For instance, suchproblems as supplying the mast (rig) or other items required for drilling, as well as supply of other important project items have made it impossible to exploit any of the South Pars phases in recent years.

LITERATURE REVIEW

Nationalresearch

Khajavi (2011) studied on "A glance at the effects of new US plan to boycott the Iranian oil industry, which first described a succinct definition of economic sanctions, then studied the causes, motives, and the course of economic sanctionsand its stages, and addressed the issues raised for the oil industryby the sanctions. Finally, the effect of sanctions was discussed on the economy and its consequences. Due to the fact that the oil industry has a critical position as the vital artery of the country's economy, all the experts need to examine the existing conditions and provide appropriate measures to overcome this crisis.

Esfandiari and Moradi (2012) investigated "Identifying the status of petrochemicals in Iranian economy". Their results showed that the petrochemical sector hada strong and weak late and early bonds not considered as a key component in all of the used methods. Astrong late bond suggests a high proportion of the sector's intermediate demand, so the petrochemical sector is more likely to be an upstream industry for most economicsectors and its degree of self-sufficiency is high compared to other economic sectors.

Bakhshayesh and Mostafahi (2013) explored the effects of economic sanctions on bothoil and gas industries in Iran. In the industry sector, mother industries and those that mainly supply their technologies and production factors, including raw and intermediatematerials, from other countries, as well as industries that regard other countries as destination markets and are export-oriented will be surely the most vulnerable to international sanctions. They tried to address negative effects of sanctions, especially in the oil and gasfields as the two main sources of currency supply in the country. Suchimpacts appear both directly and indirectly, of which the negative effects in the form of corruption and bribery will result in reduced economic growth, thereby, in decreased oil and gas revenues in Iran.

Moazami (2013) studied some strategies to counteract the effects of sanctions on Iran's oil industry, with an emphasis on the development of university and industry cooperation. Although the availability of energy resources is primarily regarded as a strength and a divine blessingto their owners, economic dependence on these resources would sometimesbecome a bottleneck for their owners arising from the desire of great powers to dominate these strategic goods. One of these bottlenecks is the coalition of a group of countries to deprive resource owners of some

privileges or change their diplomatic behavior, so called a boycott. The incentives for sanctions and their levels vary, hence, their success rate varies as well.

Bagheri et al. (2014) investigated the effect of economic sanctions on the performance of internal factors in small and medium industries of LorestanProvince. They collecteddataof the study population and analyzed them using SPSS software by regression analysis. Their results indicated that economic boycotts had negative effects on the performance of internal factors of production, marketing and finance, while the internal factors of management, research and development of small and medium industries inLorestanwere positively influenced by the boycotts.

Nobakht (2014) explored both short-term and long-term impacts of international oil sanctions on Iran's energy sector. They foundthat medium- and long-term impacts of sanctions led toa pressure on foreign investment and compulsory withdrawal of international companies resulting in dropped oil production. Intensive financial constraints and debarments on Iranian oil imports have pressurized Iran's oil revenues as a short-term effect of sanctions, particularly in recent months, which has been associated withbannedexport cover for Iranian oil tankers. Theyintendedto study the impacts of international sanctions on the energy sector and also on the investments and presence of international companies. An estimationwas further made of short-term costs resulting from dropped oil purchases caused by oil sale sanctions. The results also indicated that the sanctions did not succeed in achieving the ultimate goal of the United States, namely, altering the political behavior of Iran, becauseof widespread social base of the Iranian government, the large size of the Iranian economy, and the diminutive effects of the sanctions as a pressing tool at the 21stcentury.

Sadeghi (2014) conducted a research entitled "US sanctions against Iran and anti-sanction agility". Sanctions can be rationally restrained and managed in spite of the wide range of anti-Iranian targeting. But the effectiveness and adequacy of these sanctions are exacerbated by self-sanctions, in the light of whichdomestic structures duplicate the efficiency of foreign sanctions. The authors believe that sanctions can be restrained and converted into anti-sanctionsin the midtermthrough elimination of some inadequacies and inconsistencies present in the economic structure, as well as by modification of some socio-cultural beliefs.

In a study titled "The theoreticbasis of economic sanctions against the Islamic Republic of Iran", Mostafa (2014) stated that the issue of economic sanctions against I.R. of Iran has always been accompanied by the most fundamental question, that is, the success or failure of such sanctions. The answer to this question would certainly confirm the ineffectiveness ofthe existing traditional view, and even in the most optimistic situation, the answer to such a question will be very controversial with nokind of certainty. The problem may be that presenting a definition of success is problematic in such a situation. It should be noted that basic goals of sanctions are highly important in assessing the success rate of sanctions. All economic theories assumethat if sufficient pressure is exerted on the economic weaknesses of the country undergoing sanctions, the country will have to change its behavior. Given this hypothesis, energy can be considered the Achilles' heel of the Iranian economy as the energy sector can be a great target for economic sanctions.

Valizadeh (2016) reviewed the strategies and implications of boycott theories in the international political economy. Debates regarding the impact of sanctions on the development of technological innovation have been thriving in the current conditions of the country.

Nevertheless, such debates have little academic background due to the lack of theoretical literature on the interconnection of international sanctions and the level of technological development. They mainly questioned whether it is possible to develop a framework in order toevaluate anti-sanction strategies from the perspective of technologicalinnovation by an objective view on the broad spectrum of embargoed countries in which high-tech countries liealongside quiescent ones. Based on the experience of the two selected models from China and India, the above question is answered bytriggering the design process of a framework for assessing the stage of national innovation system. The internal interactions of such a system are categorized in three stages of formation, consistency, and maturity based on the relationship between the center of innovation in defense and consumer industries. Subsequently, a framework is developed that describes the success extent of counter-sanctions strategies in target countries through the maturity level of the national innovation system. In the conclusion, there is also a brief discussion on the current situation in Iran.

Paitakhti (2016) explored the impact of sanctions on theemployment status of Iranianwomen. One of the most important criteria for measuring the development level of a country is the importance and credit given to women in that country. In order to realize social development, accelerate the process of economic development, and vindicate social justice, a positive impact is surely achieved on the development and both quantitative and qualitative improvement of human resources of the society, provided that women are viewed as an active and productiveworkforce. A number of factors can affect boosting women's employment rates, or threat women's employment, among whichsanctions are of paramount importance. Sanctions can dramatically pave the ground to reduce women's recruitment and significantly decline the employment rate of these economically active workforce. The author further studied the effects of sanction indices, globalization, government size, banking facilities, and inflation on women's employment in Iran during 1979 to 2013. The autoregressive distributed lag (ARDL) modelwas used to estimate the effects of variables. The results of ARDL calculations showed that sanction indices, government size, and inflation had negative impacts on women's employment, but the indicators of globalization and banking facilities positively impactedwomen's employment.

Conceptual model

The following model includes the concepts, components, and indicators considered in this research. The relationships between the concepts identified in the hypothesesare presented in the analytical model of research:
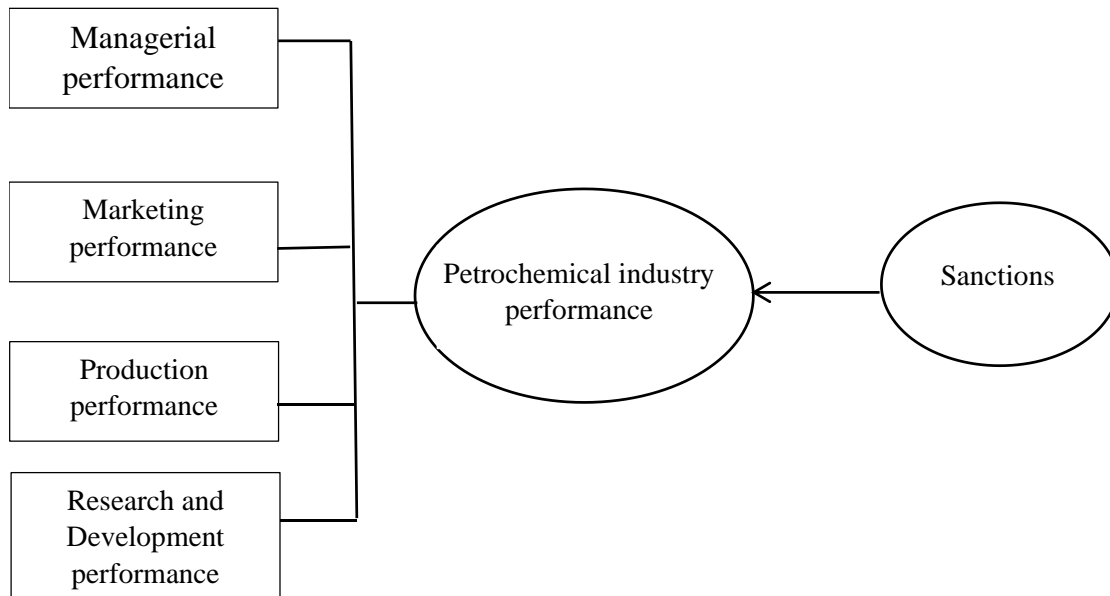
Figure 1: Conceptual model of this research based on Bass (2000).

Hypotheses

Main hypothesis

Sanctions apparently affect the performance of the petrochemical industry in Mahshahr area.

Sub-hypotheses

1. Sanctions seem to affect the managerial performance of the petrochemical industry in Mahshahr area.
2. Sanctions seem to affect the marketing performance of the petrochemical industry in Mahshahr area.
3. Sanctions seem to affect the production performance of the petrochemical industry in Mahshahr area.
4. Sanctions seem to affect the research and development performance of the petrochemical industry in Mahshahr area.

METHODS

Objectivemethod

The research method is applied interms of the objectivepursuing three different goals. Sometimes a research is to solve a common problem in the workplace, and sometimes the goal is to add to the general body of knowledge in a domain, and apply the results to solve a particular problem within an organization, referred to as an applied research. Such a research employs theories, principles, and techniques used in new baseline research to solve real-life practical problems. These studies focus more on the most effective action and understimatethe causes. But a study is called fundamental when carried out to increase our knowledge and understanding of particular problems occuring in organizational environments and thewaysof solving them.

Therefore, this study intends to investigate the reasons for the lack of development of electronic insurance marketing in Iran (case study: Fars province).

Objective method

The research method is descriptive-correlational in terms of the objective. A descriptive study is used to understand the characteristics of organizations that have similar procedures. Any descriptive study is to describe the aspects of the desired phenomenon with individual, organizational, and other viewpoints. In many cases, such information may have a vital aspect even before any respect for changing working procedures. Therefore, a descriptive-correlationalmethod was used in here.

Implementationmethod

The research method is survey-based and the correlation analysis isa statistical instrument to determine the type and degree of the relationship of a quantitative variable with another one. Correlation coefficient is one of the criteria used to determine the correlation between two variables showingboth the severity and the relation (direct and indirect). This coefficient varies between 1 and -1, being equal to zero in the absence of a relationship between the two variables.

Data collection

Generally, data collection method can be divided into two categories of library and field methods. Primary data are those collected for the first time in a specific research. After identification of research objectives and data needs, the next step in the research project is to ensure the availabilty of secondary resources. In general, the information needs of the research project cannot be fully met with secondary resources. As a result, the researcher turns to original resources and collectsdatathrough the respondents, observation, and experimentat this stage. Respondents are the main source of information. Various types of information that can be obtained from respondents include past behavior, thinking, impressions, and their characteristics (Venus, 2008). In this research, library and field study methodswere used to collect data. However, a major burden of the research work was on the insurance and customer insurance staff.To gather and make use of their ideas, questionnaire and teaching methods were designed and distributed among customers and employees.

Complete description of data collection

Information used in marketing research can be divided into two categories of primary and secondary information. The latter is the one currently available compiled for purposes other than the topic of the current research. Initial dataarethose gathered to answer a particular marketing research question. Available library and internet resources were among the secondary data used in this research. Initial data were□collected by a questionnaire and through interviews.

Statistical population

Our statistical population included all employees (n = 1850) of the petrochemical industry in Mahshahr region.

Sample size and sampling method

Sampling

Cluster sampling method was used considering that there are about 19 petrochemical companies in Mahshahr petrochemical industry.

Samplesize

A sample size of318 subjects was determined byCochran's formula.In general, data scale and general recognitionof having quantitative/qualitative statistical data are very important to determine the sample size. Because the samplesize was uncertain and a qualitative variable was examined here, asample size of 318 individuals wascalculated by the following formula:

$$n = \frac{(1.96^2) \times 0.5 \times 0.5}{0.05^2} = 318$$

Data collection tool

According to the research goals, the best way found fordatacollecttionwas to use a questionnaire. After several explorations and interviews with people and experts, standard questionnaires were identifiedfor the research.

Questionnaire

The best way to collect data was found to be using a questionnaire according to the study goals. Standard questionnaires were prepared for the research after several examinations and interviews with individuals and experts. The required data were collectedthrough field survey and distribution of a researcher-made questionnaire consisting of two parts. The first part refers to individual characteristics including gender, education level, and career experience in this industry.The second part belongs to the measurement of research variables containing 24 questions.

Questionnaire validity

Validity and accuracy of measuring scales are evaluated based on validity and reliability. Validity means that the evaluationscale can measure the intended characteristic and not another attribute. In this research, the questionnaire validity was determinedby the symbolic or face validity. The original questionnaire was sent to several professors, experts and managers of the petrochemical industry in Mahshahr in order to comment whether or not the questions canmeasure intended goals. Then, their commentswere appliedin the questionnaire and necessary changes were made to the questions under the supervision of the supervisor and advisor.

Reliability

The reliabilitywas determined by Cronbach's alpha method yielding a an acceptable alpha coefficient of0.76 for the questionnaire. Finally, the questionnaire was distributed among the statistical sample.

Testing the hypotheses

Thevariables ofresearchhypotheses were examined using SPSS software and one-sample t-test. Main hypothesis: Sanctions apparently affect the performance of the petrochemical industry in Mahshahr area.

H0: Sanctions do not seemto affect the performance of the petrochemical industry in Mahshahr area.

H1: Sanctions seem to affect the performance of the petrochemical industry in Mahshahr area.

Table 1. One-sample t-table for sanctions impact on the petrochemical industry performance

n	x	SD	t	Df	Sig
152	36.7	4.47	95.31	318	0.000

The above table and the results of one-sample t-test show that since the observed significance level (sig = 0,000) is < 0.05 and t = 95.31, H0 is rejected and H1 is accepted. A 99% confidence level indicates that sanctions are among the factors affecting the performance of the petrochemical industry.
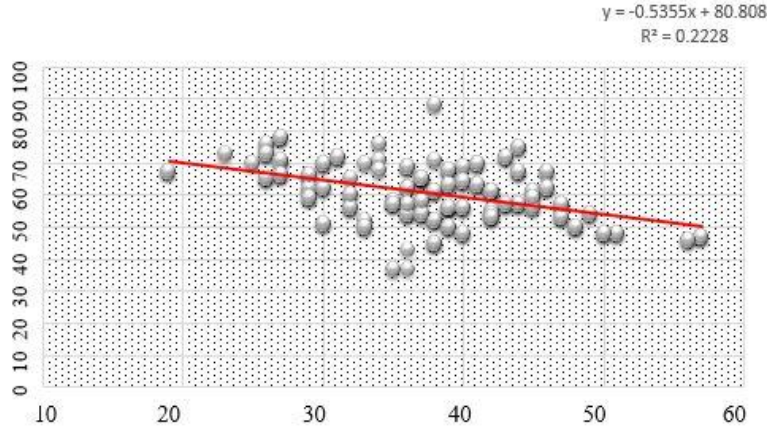
y = -0.5355x + 80.808
R² = 0.2228

Figure 2: Distribution of sanction scores on the industry's performance

First sub-hypothesis: Sanctions seem to affect the managerial performance of the petrochemical industry in Mahshahr area.

H0: Sanctions do not seem to affect the managerialperformance of the petrochemical industry in Mahshahr area.

H1: Sanctions seem to affect the managerialperformance of the petrochemical industry in Mahshahr area.

Table 2. One-sample t-test for the managerialperformance component

n	x	SD	t	Df	Sig
152	30.98	3.67	101.31	318	0.006

Table 2 and the results of one-sample t-test indicate that since the observed significance level (sig = 0,000) is < 0.05 and t = 101.31, H0 is rejected and H1 is accepted. A confidence level of 99% suggests that managerial performance is among the factors not affected bysanctions inMahshahr petrochemical industry, hence, rejectingH0.

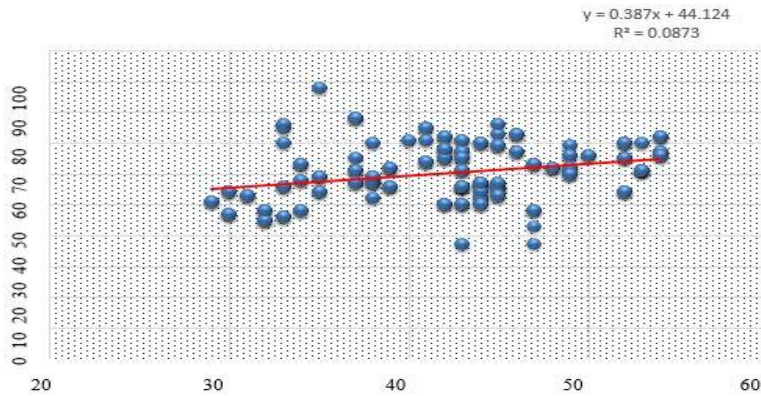y = 0.387x + 44.124
R² = 0.0873

Figure 3: Distribution of sanction scores on the managerial performance

Second sub-hypothesis: Sanctions seem to affect the marketing performance of the petrochemical industry in Mahshahr area.
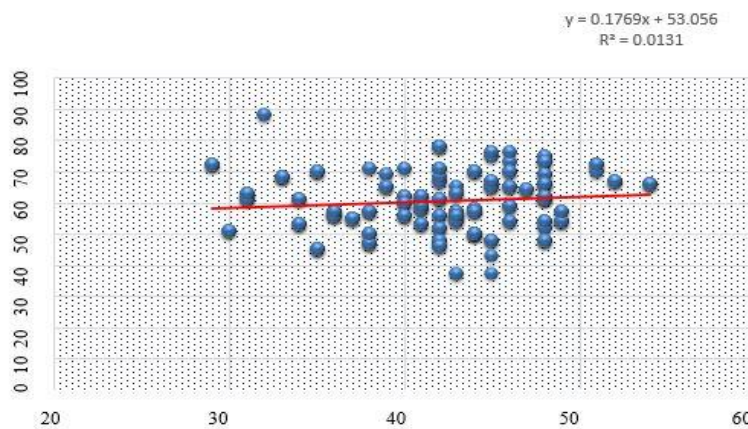
H0: Sanctions do not seem to affect the marketing performance of the petrochemical industry in Mahshahr area.

H1: Sanctions seem to affect the marketing performance of the petrochemical industry in Mahshahr area.

Table 3. One-sample t-test for component of marketing performance

n	x	SD	t	Df	Sig
152	39.50	3.76	88.09	151	0.000

Table 3 and the results of one-sample t-test reveal that because the observed significance level (sig = 0,000) is < 0.05 and t = 88.09, H0 is rejected and H1 is accepted. A confidence level of 99% implies that marketing performance is among the factors affected by sanctions in Mahshahr petrochemical industry, hence, rejecting H0.

$y = 0.1769x + 53.056$
$R^2 = 0.0131$

Figure 4: Distribution of sanction scores on the marketing performance

Third sub-hypothesis: Sanctions seem to affect the production performance of the petrochemical industry in Mahshahr area.

H0: Sanctions do not seem to affect theproduction performance of the petrochemical industry in Mahshahr area.

H1: Sanctions seem to affect the production performance of the petrochemical industry in Mahshahr area.

Table 4.One-sample t-test of production performance component

n	x	SD	t	Df	Sig
152	38.87	6.50	73.69	151	0.000

Table 4 and the results of one-sample t-test show that because the observed significancelevel (sig = 0,000) is < 0.05 and t = 73.69, H0 is rejected and H1 is accepted. A confidence level of 99% indicates that the productionperformance is among the factors affected by sanctions in Mahshahr petrochemical industry, hence, rejecting H0.
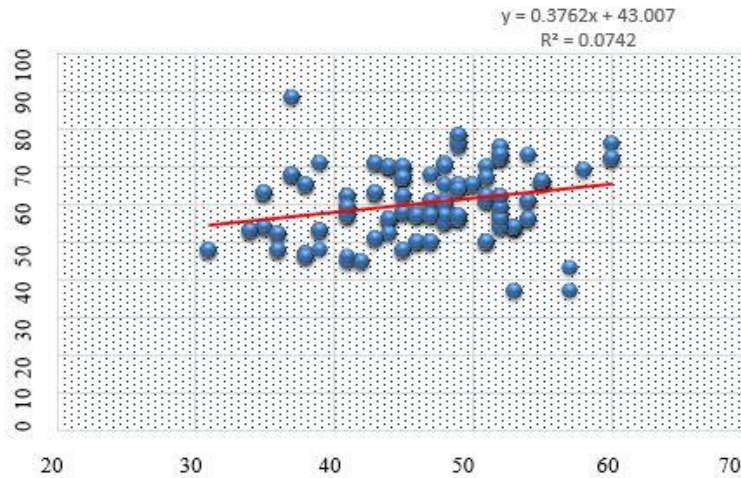
Figure 5: Distribution of sanction scores on the production performance

Fourth sub-hypothesis: Sanctions seem to affect the research and development performance of the petrochemical industry in Mahshahr area.

H0: Sanctions seem to affect the research and development performance of the petrochemical industry in Mahshahr area.

H1: Sanctions do not seems to affect the research and development performance of the petrochemical industry in Mahshahr area.

Table 5. One-sample t-test of production performance component

n	x	SD	t	Df	Sig
152	40.76	5.48	91.59	318	0.000

Table 5 and the results of one-sample t-test indicate that because the observed significance level (sig = 0,000) is < 0.05 and t = 91.59, H0 is rejected and H1 is accepted. A confidence level of 99% shows that the research and development performance is among the factors affected by sanctions in Mahshahr petrochemical industry, hence, rejecting H0.
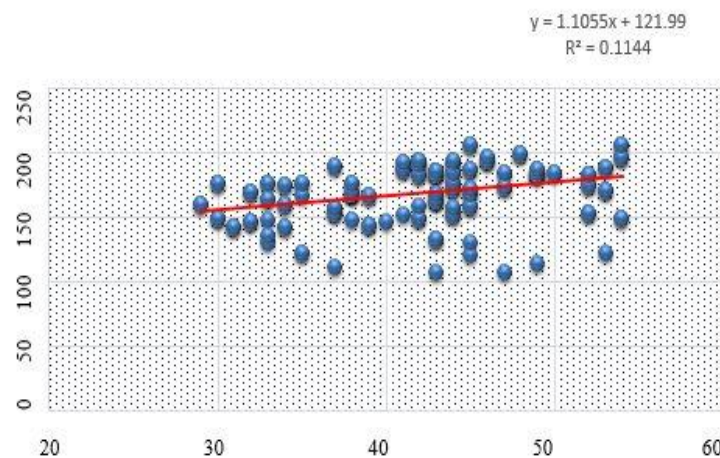

Figure 6: Distribution of sanction scores on the research and development performance

Table 6. Overall results of one-sample t-test

	Hypotheses	t	Sig	Result
1	Sanctions seem to affect the performance of the petrochemical industry in Mahshahr area.	95.1	0.000	Confirmed
2	Sanctions seem to affect the managerial performance of the petrochemical industry in Mahshahr area.	101.5	0.000	Confirmed
3	2. Sanctions seem to affect the marketing performance of the petrochemical industry in Mahshahr area.	88.09	0.000	Confirmed
4	Sanctions seem to affect the production performance of the petrochemical industry in Mahshahr area.	91.59	0.000	Confirmed
5	Sanctions seem to affect the research and development performance of the petrochemical industry in Mahshahr area.	73.69	0.000	Confirmed

SUGGESTIONS

1. According to the main hypothesis, it is proposed to use experts andexperiences of other countries, train human resource continuously,and improve their ability;
2. Based on the first hypothesis, it is recommended that managers be aware of crisis management practices in order to effectively manage sanction conditions;
3. Considering the second hypothesis, it is suggested to adopta policy to encourage the increase of domestic production and export abroad (through the removal or reduction of customs tariffs and other government support);
4. According to the second hypothesis, it is proposed that efforts be made to expand trade and economic relations with emerging countries;
5. According to the second sub-hypothesis, it is recommended to use marketing research to evaluate marketreqirements;
6. Domestic investments for development of manufacturing equipment needed in the domestic industry;
7. Based on the third sub-hypothesis, it is recommended to link between small and medium industries with large ones in order to order intermediate goods and pieces needed through industrial subcontracting,thereby, activate and boost the petrochemical industry;
8. According to the third sub-hypothesis, it is suggested to produce various and high-quality products in the petrochemical industry;
9. Considering the fourth sub-hypothesis, it is suggested to makea necessary polic in order to establish a proper relation and collaboration between higher education institutions and industries, thereby, increase research and development in the petrochemical industry;
10. With regard to the fourth sub-hypothesis, it is suggested that the government support the creation of science and technology parks, industrial universities, and research and development centers.

Future suggestions

In order to obtain more accurate results, the field of research should be narrowed from small and medium industries to a few specific and important industries, with more scrutiny on influential factors to examine the effects of sanctions on those factors.

Taking into account that the present research investigates the industries in Lorestan province, future researchers can possiblly examine several similar industries at different parts of the country and compare the results.

It is proposedtoexamine industries separately in order to achieve clearer results.

Since various sanctions have been imposed against Iran at different periods, it is possible to study the impacts of sanctions on specific industries by differentiating various periods.

Research limitations

1. The data collection tool was limited to a questionnaire. Among the limitations contained in the questionnaire is that the respondents may not have responded truely and correctly to the questions in the questionnaire. Therefore, the use of other data collection tools (e.g. observation and interview) can provide more comprehensive results.
2. This research has been conducted with a general and comprehensive approach to the effects of sanctions during a decade. However, the economic sanctions imposed on Iran at different times were different especially in the past years with each sanctionexerting varying effects on different sectors of the industry.
3. Research findings are only limited to the duration of data collection and its validity is limited to a short period of time. Time lapse may change the results, thus, it is necessary to runsimilar research in future periods.

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