

Selecting Appropriate Strategy to Enhance Petrochemical Products Export

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ABSTRACT

Iran is one of the leading countries in terms of petrochemical reserves and its economy is dependent mainly on oil and gas sector. The country with such vast amount of natural resources is supposed to be one of the world's most developed countries by promoting other economic sectors through oil and gas production and exports. Still Iran is among the developing countries. There can be different reasons, among them international sanctions that prevent the increase of petrochemical products exports. However, for the current research the lack of appropriate strategies has been considered an obstacle for petrochemical products export. Therefore, the current research offers the strategies which are aimed to improve the exports of Iranian petrochemical products.

KEYWORDS: petrochemicals, enhancement, exports.

1. INTRODUCTION

Petrochemical industry has a highly important role in the creation of value added of the oil reserves of our country. Having 33 trillion cubic meters of gas reserves, Iran holds eight percent of the global discovered natural gas.

In other words, Iran is the second gas owner (about 16%) of the world. On the other hand, our country, with more than 138 billion barrels of exploitable crude oil and natural gas condensates, holds equal to 11% of the global oil [1,2]. Considering this giant hydrocarbon resource as an "economic advantage", the petrochemical industry can have a noticeable position in the country's economy.

A look at the non-oil export of the country in the past years demonstrates the importance of petrochemical products. Moreover, the role of petrochemical products in the development of the domestic industries can also be regarded as exceptional. The industries such as agriculture, automation etc. owe to the services of petrochemical industry. On the other hand, the exceptional act of gasoline production in the petrochemical complexes should not be ignored [6].

As the globalization expands evermore, no country can stay in the manner of dreaming autocracy without being present continually and effectively in the international market. The economic isolation era of the countries has been passed by; therefore, in such a condition the investigation of the available strategies and extraction of an effective and efficient strategy becomes highly important.

Petrochemical concept refers to the chemistry of oil. The lack of strategies and strategic thinking is the major problem in our petrochemical industry. Our problem is the absence of the thinking that gives us a practical strategy to enhance the exports of chemical substances produced from oil.

Therefore, the goal of this study is to investigate three main strategies of Porter's Model including Cost Leadership, Differentiation and Focus [3, 4, and 9]. Regarding each strategy, the most efficient sub-strategy was introduced. Also, at macro level, the most effective strategy is identified.

RESEARCH METHODOLOGY

The research is descriptive and practical. To collect data, a combined method has been used, which consists of library and field studies. The space area of the research is Iran's National Petrochemical Company as well as the companies relating to petrochemical production.

In the research, the descriptive statistics; i.e. central tendency, frequency and relative frequency, were used to describe the data. To answer the research questions (hypothesis testing) inferential statistics was used. Excel, SPSS and Minitab are the software programs used as the instrument to describe and analyze the data.

As it has been mentioned, the present research seeks for the identification of the effects of cost leadership, differentiation and focus strategies on the enhancement of Iran's National Petrochemical Company products export. Each strategy was measured using some micro-strategy or using the questions being available in the questionnaire.

Finally, in order to measure the effect rate of the considered strategies, a questionnaire with 35 main questions and a number of questions regarding the personal specifications of respondents was designed. The questionnaire reliability was examined and confirmed using the pre-test data (with Cronbach's alpha value being 0.918 for the whole questionnaire). After questionnaire confirmation, the field operations to collect the questionnaire were conducted. At this stage, regarding the statistical population, the questionnaire design was completed through sending the questionnaires to the managers and the professionals as well as the specialists and using the stratified

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sampling method in each group. In the considered period, totally 300 questionnaires by managers and professionals and 400 questionnaires by specialists have been completed and finally confirmed.

Further, the data have been put into Excel software program. The data were also corresponded and integrated in this program. To do statistical analyses and to calculate the indices, the available data were transferred to SPSS and Minitab statistical programs so that the considered outputs would be reached.

At information description stage, first the descriptive specifications of the respondents were investigated. Then the main factor indices of the model are investigated. At this stage, some methods such as frequency table, descriptive indices and various statistical diagrams (such as box and histogram) were used.

Kolmogorov–Smirnov test of normality, T-test and Friedman test have been used to test the proposed hypotheses:

1. Cost Leadership Strategy is significantly effective on the enhancement of Iran’s National Petrochemical Company’s export.
2. Differentiation Strategy is significantly effective on the enhancement of Iran’s National Petrochemical Company’s export.
3. Focus Strategy is significantly effective on the enhancement of Iran’s National Petrochemical Company’s export.
4. The effect of all strategies on the enhancement of Iran’s National Petrochemical Company’s export is not equal.

ANALYSIS AND RESULTS

As mentioned, T-test is used to test the first three hypotheses of the research. In this test, being the value of each investigated factor larger than the average value; i.e. 3, the researcher hypothesis is confirmed; otherwise, it is rejected. For testing the fourth hypothesis, Friedman test was used to compare the three factors. In this research, the researcher hypothesis plays the role of the alternative hypothesis (H_1).

Before doing calculations, the significance level of the tests should always be determined so the researcher judges the significance level about the hypothesis based on it. In this study, the significance level for all of the statistical tests is considered 95%. In this manner the hypotheses are tested through the Type I error, which is below five percent. Thus, it is obvious if

- The test probability is below 5%, the null hypothesis (H_0) is rejected; therefore, the alternative hypothesis (H_1) is supported. (As mentioned before, the researcher’s hypothesis is the alternative hypothesis.) And,
- If the test probability is over 5%, the null hypothesis (H_0) is supported; therefore, the alternative hypothesis (H_1) is rejected.

Test probability here means the judgment criterion regarding the hypothesis.

Cost Leadership Strategy

Table 1: Descriptive analysis of “cost leadership strategy”

Statistical index	Cost leadership strategy
Available number	699
Non-responded number	1
Mean	4.15
Mode	5
Standard Deviation	.62
Minimum	1.38
Maximum	5
First quarter	3.83
Second quarter (median)	4.28
Third quarter	4.62

In table 1, the descriptive characteristics of the cost leadership strategy are presented. As it is obvious, the mean value is 4.15, which indicates the effectiveness higher than “High” choice of the strategy in total. The median value of the factor, also, confirms the same fact. With respect to the mode index, the highest chosen number for this factor is the value 5, which indicates very high effect of this strategy based on the opinions of the respondents.

Table 2: Normality test of “cost leadership strategy”

Statistical index	Cost leadership strategy
Kolmogorov–Smirnov test of normality	1.335
Asymptotic probability value	.120
Test result	Data normality assumption confirmed

As we can see in Table 2, considering the probability value being higher than 0.05 of the test, the data normality assumption is supported. Hence, regarding this variable, we can use the statistical parametrical methods to analyze data.

Differentiation Strategy

Table 3: Descriptive analysis of “differentiation strategy”

Statistical index	Cost leadership strategy
Available number	698
Unresponded number	2
Mean	3.62
Mode	3.33
Standard Deviation	.63
Minimum	1.83
Maximum	5
First quarter	3.18
Second quarter (median)	3.67
Third quarter	4.08

In table 3, the descriptive characteristics of the differentiation strategy are presented. As it is obvious, the mean value is 3.62, which indicates the effectiveness higher than “Average” choice of the strategy in total. The median value of the factor, also, confirms the same matter. With respect to the mode index, the highest chosen number for this factor is between the choices of average and high; i.e. the value 3.3, which indicates the average effect of this strategy based on the opinions of the respondents.

Table 4: Normality test of “differentiation strategy”

Statistical index	differentiation strategy
Kolmogorov–Smirnov test of normality	1.062
Asymptotic probability value	.183
Test result	Data normality assumption confirmed

As we can see in Table 4, considering the probability value being higher than 0.05 of the test, the data normality assumption is supported. Hence, regarding this variable, we can use the statistical parametrical methods to analyze data.

Focus Strategy

Table 5: Descriptive analysis of “focus strategy”

Statistical index	Cost leadership strategy
Available number	695
Un-responded number	5
Mean	3.81
Mode	4.33
Standard Deviation	.62
Minimum	1
Maximum	5
First quarter	3.33
Second quarter (median)	3.89
Third quarter	4.33

In table5, the descriptive characteristics of the focus strategy are presented. As it is obvious, the mean value is 3.81, which indicates the effectiveness higher than “Average” choice of the strategy in total. The median value of the factor, also, confirms the same matter. With respect to the mode index, the highest chosen number for this factor is higher than the choice high; i.e. the value 4.33, which indicates the relatively high effect of this strategy based on the opinions of the respondents.

For the first three hypotheses, since the normality of the whole data was confirmed and regarding the nature of the hypotheses, the one-sample T-test is used. If the value of each factor is higher than 3; i.e. an average value, the effectiveness of that strategy is higher than the average amount and tends towards High and Very High choices. Hence, in such a situation the researcher’s hypothesis is confirmed; otherwise, it is rejected.

For the fourth hypothesis, regarding the need to compare the effectiveness of the factors, Friedman test is used.

Table 6: Friedman test for fourth hypothesis

	Value
Number of data	694
X ² statistics	346.65
Degree of freedom	2.00
Asymptotic probability value	0.00

As it is obvious in Table 6 considering the p-value below 0.05, the effect equality hypothesis of the three strategies is rejected. The next stage provides the rank mean index, which is specific to Friedman test, for the three strategies to allow the possibility of making the final decision about the hypothesis.

Table 7: Rank mean index of the three analyzed strategies

Strategies	Rank mean
Cost leadership	2.52
Differentiation	1.53
Focus	1.95

As we can observe, the highest rank mean is for cost leadership strategy and the lowest amount is for the differentiation strategy.

After testing the hypotheses through T-test statistical technique for the first three hypotheses and Friedman test statistical method for the fourth hypothesis, the hypotheses were supported based on the following arguments:

1. The first hypothesis; i.e. "effectiveness of cost leadership strategy on the enhancement of Iran's National Petrochemical Company's export", was supported after being tested; hence, cost leadership strategy, with the mean value of 4.15, has a significant effect on the enhancement of Iran's National Petrochemical Company's export.
2. The second hypothesis; i.e. "effectiveness of differentiation strategy on the enhancement of Iran's National Petrochemical Company's export", was supported after being tested; hence, differentiation strategy, with the mean value of 3.62, has a significant effect on the enhancement of Iran's National Petrochemical Company's export.
3. The third hypothesis; i.e. "effectiveness of focus strategy on the enhancement of Iran's National Petrochemical Company's export", was supported after being tested; hence, focus strategy, with the mean value of 3.891, has a significant effect on the enhancement of Iran's National Petrochemical Company's export.
4. The fourth hypothesis; i.e. "among the three strategies, the cost leadership strategy has the highest effect on the enhancement of Iran's National Petrochemical Company's export", with the mean value of 2.52 in comparison with other strategies (focus strategy with the mean value of 1.95 and differentiation strategy with the mean value of 1.53) was supported after statistically being tested.

Conclusion and Recommendations

In this research, cost leadership strategy is the main strategy from the viewpoint of the managers and specialists. Therefore, Iran's National Petrochemical Company, in the path of fulfilling its objectives, needs to plan the necessary practices to enforce the cost leadership strategy emphasizing the mentioned goals.

Due to the fact that the differentiation strategy's effectiveness was recognized significant based on the views of managers and specialists, it is recommended to conduct some research and to identify and produce the products that can lead to differentiation and attract the customers. Especially, for the selection of the appropriate strategy to enhance petrochemical products export, in terms of differentiation strategy creating high level of skills in process design, using innovation in production lines (modern equipment and computer-based systems) as well as encouraging creativity should be emphasized.

Due to the fact that the focus strategy's effectiveness was recognized significant based on the views of managers and specialists, it is recommended to have the necessary focus on the customer, especially by offering some unique services to some special customers. In addition, it is recommended to increase the centralized authorities. Particularly, some special locations can be focused for the supply of petrochemical products.

As cost leadership strategy has a special importance its application and enhancement of marketing competence can solve a great part of petrochemicals export problems.

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