

Investigating the competitive advantage of medicinal plants and related products

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ABSTRACT

Background and aims: The main objective of this study was to investigate the factors affecting the achievement of the competitive advantage in the international markets for medicinal plants and related products in Zagros forests.

Methods: This is an applied descriptive/correlational research, because in addition to describing the current situation, its tests hypotheses are based on multiple regression method and determines the impact of variables using the inferential statistics method. In addition, it is an applied research since its expected results can be used to improve the international market of medicinal plants and related products in the Zagros forests. The study population included all customers of medicinal plants and related products in Zagros forests. Considering the fact that the population size is unlimited and undefined, the sample size formula was used. The method used in this research is the cluster sampling and available non-probability sampling. Initially, the Zone was divided into four parts: north, south, east and west. Then, the questionnaires were distributed. The sample size was calculated as 384 people utilizing sample size formula for unlimited population. In this research, the variables of interest were measured using researcher made questionnaires which were distributed among selected subjects whose views will be assessed on the variables. Finally, the collected data was analyzed using SPSS software.

Results: The results showed that medicinal plants, diversity of medicinal plants, and industrialization of medicinal plants and production of the most essential drugs even certain drugs would lead to the achievement of competitive advantage in the international market of medicinal plants and related products in the Zagros forests.

Conclusion: Paving the way for investment in the country will make great contribution to the export of medicinal plants products.

Keywords: Medicinal plants, Competitive advantage, Industrialization, Diversity of medicinal plants.

Original article

INTRODUCTION

Competitive advantage refers to the increased amount in the attractiveness of a company's offers compared with competitors according to customer's view. The competitive advantage aims to

differentiate the characteristics or dimensions of any company that enables it to provide better services to customers than other competitors (better value). The competitive advantage is the company's

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available values for customers in a way that these values are higher than customer's costs. Thus, it can be said that competitive advantage refers to a set of unique capabilities of an economic unit, which allows desired markets to influence customers and help that unit achieve upper hand over its competitors. The above definitions and other definitions of competitive advantage indicate that the requirements and dimensions of competitive advantage are determined by direct connection to the customer values, company's values and values offered by its competitors. If based on the customer view, a company's values compared with other companies are more consistent and closer to his/her values and expectations, it can be said that the company in question has a competitive advantage in one or more indices over its competitors. Therefore, the company will be more prosperous than its competitors in the market in terms of proximity to customers and finally attracts their attention.

The use of medicinal plants for treatment purposes is as old as human life. Man in all historical ages had no choice but to resort to plants. Although in the past half century, the use of synthetic and chemical drugs has increased dramatically but their harmful effects on life have caused human to turn to the use of medicinal plants again. The fact that the use of medicinal plants has always been one of the effective methods of treatment in the past is clearly evident.¹

The history of medicine in Iran dates back to the Aryan period and Avesta (6500 BC.) is the first book that spoke of medicinal plants. Zoroastrian Home or sacred plant is the oldest medicinal plant in the history of Iran. In addition to the antiquity, sphere of influence of these plants is very remarkable in the history of religions and nations to the extent that they were of great importance in historical, political,

social and religious events or led to major events. By meticulously exploring religious, historical and literature sources, names of medicinal plants, appellation and events related to these plants can be frequently observed.² Thus, by studying the history of medicinal plants in Iran and the world, we will find that great attention was given to the industry from the old days.

According to estimations made in recent years, the global market value of herbal medicines, including medicinal plants and their products has always been increasing with a significant growth. Since much of the world market of medicinal plants is related to the production of the secondary metabolites derived from these plants, secondary metabolites usually have very high added-value, which amounts to few thousand dollars. According to available statistics, the global market value of plant-derived drugs in 2002, increase by 6.2% a year earlier to 13.7 billion dollars. It was predicted that this amount will reach \$ 18.8 billion in 2007. In 2002, the US accounted for more than 50% of the market. However, it is expected that the value of this market will reach a figure equivalent to five trillion dollars in 2050. In terms of the economic potential of medicinal plants, it can be said that Iran is one of the most important countries in the world that has high potential in the field of medicinal plants production.

The competitive advantage refers to situation that enables a firm to offer products with higher quality and makes more profits for the firm while competing with competitors by applying better methods and higher efficiency. An economic unit will benefit from the competitive advantage due to specific reasons associated with its features, when it steadily offers products with lower cost and higher quality than competitors (such as location, technology, personnel, etc.). The present study hopes to

assist in identifying the effective factors in achieving the competitive advantage in the international market of medicinal plants and related products in the Area of Zagros forests by seeking views of customers and then by processing this raw data into usable tables, diagrams and results for producers of medicinal plant and related products in the area. It also hopes that a step in the development of medicinal plants industry and related products in Iran will be taken. Therefore to create, maintain and develop the competitive advantage at the firm level, sector and national economy is considered as an approach to the economic development, and the increased competitiveness has been proposed as the main challenge for the international trade and the economic development plans.³

Considering the growing trend of globalization, it seems that promoting the competitive advantage of Iran is possible only by having a constructive and effective interaction with international economy and benefiting from a dynamic competitive advantage. At the same time, the manner with which different parts interact with the international economic system heavily depends on the competitive advantage. Obviously, the more a country's competitive advantage in the business field at the global level is, the more its interaction level with the world economy will be due to its easier access to foreign markets. With respect to the capital intensity among countries and new conditions of the global market, Ricardo's Comparative Advantage, which is based on natural resources and production factors frequency, is not the determining factor in constructive, effective and sustained engagement of the country with the global economies, but achieving a more sustainable advantage will play a more important role in this regard. Zagros forests Zone has beautiful high mountains and waterfalls, meadows and rivers with

attractive landscapes and dense forests with natural fruits that are rich in medicinal plants and food. Moreover, it may be difficult to find anywhere in this planet where the type of plants existing in this zone can be found. The dependent nature of Iran's economy on oil revenues and earnings being influenced by political and economic issues, have led to the country's economic vulnerability. One way to deal with this challenge is to develop products whereby not only the domestic economy will be improved, but also non-oil exports will be increased. Meanwhile, forest products, pasture and industrial plants in addition to their effect on the domestic economy, can also play a significant role in increasing the non-oil exports.

Fortunately, our country has a golden opportunity to strengthen its presence in international markets more than ever due to the country's climatic variation, which provides the opportunity to expand the growth of plants and increase the consumption of plant products in the world, especially in the developed countries, whether in the pharmaceutical industry or in the food, the cosmetics, detergents industries.⁴ Considering national enormous potential talents, as well as the culture of using medicinal plants in the country, it requires authorities to pay more attention to this issue. It also emphasizes the fact to every expert that if this issue is dealt with systematically and holistically as a national necessity and within the framework of a specific program, it will not only assist in achieving sustainable development management in this sector, especially in terms of important dimensions such as macro-economic development, environment, health (self-sufficiency in pharmaceutical production), employment, food security and genetic reserves, but also play a significant role in the national and international arena as a source of foreign exchange earnings for the country.⁵

One of the most important necessities for conducting this study was the fact that the region benefits from the competitive advantage in the production of this type of medicinal plants and improper utilization of these natural resources. Therefore, this research can by challenging the industrialization of medicinal plants and their optimum production, convince investors that the medicinal plants of the zone can be offered to the world with investment and government support and subsequently establish a powerful brand. Kashfi Bonab in a study titled: "Relative economic advantages of cultivation and trading medicinal plants in Iran and its value in world markets concluded that the cultivation of medicinal plants has positive economic returns."⁶ Cost-benefit calculation of perennial plants is still difficult because they are cultivated in the country for the first time and their cultivation rate is limited in specific areas. One or two-year-old plant, the cost-benefit analysis which has been performed can be placed in crop rotations and the crops cultivation pattern of many areas in the zones.

The most important aspect of the investigations was the issue of price fluctuations and lack of clear and reliable market for some plants, the cultivation development which was affected negatively. Therefore, it can be expected that by promoting the cultivation of various medicinal plant items, without government intervention, these plants can be produced by farmers who consider realities of the market and the domestic and overseas prices of the product. Therefore, with regard to the climate variability and different ecological conditions, it can be inferred that almost 80% of famous consumable medicinal plants of the world are produced as industrial or traditional products or grows wild in different parts of Iran. Therefore, it can be concluded that Iran has a comparative

advantage as an appropriate location for investment such that even in seasons of drought, there is no obstacle for cultivation of medicinal plants.

Cultivation of medicinal plants is less expensive compared to other crops, and their maturity is also early. Finally, it can be concluded that large profits will be made by investing in this area and in short time, the justification of the future lucrative returns will create economic value for the product. Therefore, as will be explained later, comprehensive solutions and strategies and scientific-practical recommendations can be formulated, which are helpful in realization of a considerable part of this vision on medicinal plants and Iranian medicine. This study also aims to provide useful information and solutions for researchers and an appropriate environment for investments. Toosi and Arestani wrote an article titled: "Investigating comparative advantage Industrial farming crops of Iran."⁷ In this paper, the comparative advantage and supportive indices were analyzed for industrial-farming crops, including sunflower, cotton, soybean, and sugar beet at the national level in 2005.

The results of the present study in Policy Analysis Matrix of crops shows that Domestic Resource Cost Index (DRC) creates a comparative advantage in producing cotton and soybean in Iran; In other words, producing these products in the country is more economical than their imports, while sunflower and sugar beet do not have such advantage like cotton and soybean. The nominal protection coefficient of these products is lower than their shadow price; in other words, due to government policy, the price of these products is lower than that of the shadow exchange rate which shows the implicit taxation imposed on the producers of these products. The index results of the studied crops reveal that tradable inputs are supported. In other

words, farmers have purchased these inputs with subsidization which is cheaper than the border price. They also utilized these inputs in producing sunflower and the product using effective protection coefficient (EPC).⁷

Sugar beet index reveals that the government has effectively supported these products. However, lack of effective and purposeful support is seen for other products. In a study titled: "Recognition and ranking of effective factors on achieving a competitive advantage for insurance companies" by Mazloomi and Dadvand came to the conclusion that in order to gain competitive advantage, insurance companies can focus on four areas: Efficiency, quality, innovation and responsiveness to customers.⁸ It should be noted that in this research, the internal aspect of the company have been studied to identify key successful factors for gaining competitive advantage.⁹ Therefore, we should not ignore environmental factors. The theoretical framework is a statement upon which the whole research is based. This framework serves as a logical, descriptive and developed network, including the existing relationships among variables identified following the implementation of processes such as interviews, observation, and literature review. The theoretical framework makes clear the relationship among variables and nurtured theories that are the principles of these relationships as well as describes the nature and direction of these relationships.¹⁰ As the literature review forms the basis of the theoretical framework, a good theoretical framework also provides a reasonable basis for formulating testable hypotheses.

1. Production of Medicinal plants green house, can be effective as a competitive advantage in Iran and in the international markets; 2. Industrialization of medicinal plants and production of the medications needed by the society, even certain medications

can be effective in discussing the advantages and competitiveness; 3. Investigation of the packaging of medicinal plants and their application in Zagros forests Zone can be effective in discussing the competitive advantage in other parts.

METHODS

This is an applied descriptive/correlational research; because in addition to describing the current situation, its tests hypotheses are based on multiple regression method and determines the impact of variables using the inferential statistical method. In addition, it is an applied research since its expected results can be used to improve the international market of medicinal plants and related products in the area. This is also a field research. Moreover, this is a library research since contents related to theoretical information; literature and research literature were collected on the basis of information contained in books, Journals, theses and internet. This is also a field study because it investigates variables in an organized manner and in real conditions. The study population included all customers of medicinal plants and related products in the region of Zagros forests. Due to the fact that the population size is unlimited and undefined, sample size formula was used in determining the sample size. The method used in this research is cluster sampling and available non-probability sampling. Initially, the district was divided into four parts: north, south, east and west. Then, the questionnaires were distributed. The sample size was calculated as 384 people using sample size formula of unlimited population.

$$n = \frac{(z\alpha/2)^2 \times (\delta)^2}{(e)^2} = 384$$

In this research, the variables of interest were measured using researcher made questionnaires distributed among selected subjects whose views will be assessed on the

variables. Finally, the collected data was analyzed using SPSS software.

RESULTS

The results showed that medicinal plants, diversity of medicinal plants, and industrialization of medicinal plants and production of the most essential drugs even certain drugs would lead to the achievement of competitive advantage in the international market of medicinal plants and related products in the Zagros forests.

Among the respondents, 52.6 and 47.4% were male and female respectively. Among the respondents, 0.5, 18.2, 36.5, 28.9 and 15.9% were respectively under 20, between 21-30, 31-40 years, between 41-50 years and above 51 years of age, respectively. Among the respondents, 2.1, 18.2, 9.1, 53.9 and 16.4% were diploma holders, high school graduates, associate degree graduates, bachelor degree graduates and masters degree graduates and higher. The one of participants has not given answer to the questions. Therefore, the number of participants was 384 (Table 1).

Table 1: Description of gender, age, educational level variables

Variables		The cumulative percentage	Validity percentage	Frequency
Gender	Man	52.6	52.6	2.2
	Woman	47.4	47.4	182
	Total	100.0	100.0	384
Age	20<	0.5	0.5	2
	21-30	18.8	18.2	70
	31-40	55.2	36.5	140
	41-50	84.1	28.9	111
	51>	15.9	15.9	61
	Total	100.0	100.0	384
Level of education	Under diploma	2.1	2.1	8
	High school graduates	20.4	18.3	70
	Graduates of associate degree	29.5	9.1	35
	Bachelor graduates	83.6	54.0	207
	Graduates of master's degree	100.0	16.4	63
	Total	2.1	100.0	383

The results obtained in this study suggest the highest and the lowest values

obtained for the research variables were 5 and 1, respectively. On the other hand,

the average obtained for all the research variables were greater than 3 and other

information are also given in details in Table 2.

Table 2: Description of the research variables

Variable	Number	Minimum	Maximum	Average	Standard deviation	Variance	Coefficient of skewness
	Statistics	Statistics	Statistics	Statistics	Statistics	Statistics	Standard error
Medicinal Plants	384	1.00	5.00	3.665	0.887	0.788	0.125
Industrialization of medicinal plants	384	1.00	5.00	3.412	0.750	0.563	0.125
Diversity of medicinal plants	384	1.00	5.00	3.566	0.7831	0.613	0.125
Competitive advantage	384	1.00	5.00	3.373	0.785	0.616	0.125

First hypothesis: Medicinal plants of Zagros forests Zone can be effective as a competitive advantage in Iran and in the international markets. Medicinal plants can be effective as a competitive advantage in Iran and in the international markets. $H_0: \rho = 0$; Medicinal plants can be effective as a competitive advantage in Iran and in the international markets. $H_1: \rho \neq 0$.

To test the lack of correlation among the model errors, Durbin-Watson statistic was used. The Durbin-Watson value obtained was equal to 1.771. If Durbin-Watson statistic is between 1.5 to 2.5, the H_0 hypothesis cannot be rejected, i.e. assumption of lack of correlation among the model errors is acceptable. Therefore in this case, the lack of correlation among the model errors is confirmed.

The standard beta amount shows the importance of medicinal plants in the model. The more the value of the standard beta, the more important it will be. It is evident that the first hypothesis is confirmed, i.e. the

significant amount for medicinal plants is less than the specified alpha value (0.05). Therefore, one can say that with 95% confidence interval, the medicinal plants in Zagros forests Zone can be effective in the country and in international markets as a competitive advantage. Approximately, 40.2% of the dependent variable changes is explained by the mentioned variable ($R^2=0.402$). Therefore, the research hypothesis is confirmed with 95% confidence interval. According to Beta coefficients, it also can be said that the explanatory level of the medicinal plants variable is 63.4%. In other words, it can be said that medicinal plants variable can predict the dependent variable of competitive advantage at the rate of 63.4%. This shows the importance of medicinal plants in predicting the competitive advantage.

The second hypothesis: The industrialization of medicinal plants and the production of the medicines needed by the society, even certain medications can be

effective in discussing the advantages and competitiveness.

The industrialization of medicinal plants cannot be effective in discussing the advantages and competitiveness. H0: $rx, y=0$. The industrialization of medicinal plants can be effective in discussing the advantages and competitiveness. H1: $rx, y \neq 0$.

To test the lack of correlation among the model errors, Durbin-Watson statistic was used. Durbin-Watson value obtained was equal to 1.791, If Durbin-Watson statistic is between 1.5 to 2.5, the H0 hypothesis cannot be rejected; i.e. assumption of lack of correlation among the model errors is acceptable. Therefore in this case, the lack of correlation among the model errors is confirmed.

The standard beta amount shows the importance of medicinal plants in the model and the more it is, the more important it will be. It is evident that the first hypothesis is confirmed, i.e. the significant amount for medicinal plants is less than the specified alpha value (0.05). Therefore, one can say that with 95% confidence interval, industrialization of medicinal plants even the production of certain medication needed by the society can be effective in the country and international markets as a competitive advantage and approximately 5.6% of the dependent variable changes is explained by the mentioned variable ($R^2=0.056$). Therefore, the research hypothesis is confirmed with 95% confidence interval. According to beta coefficients, it can also be said that the explanatory level of the medicinal plants variable is 23.6%. In other words, it can be said that industrialization of the medicinal plants can predict the dependent variable of competitive advantage at a rate of 23.6%. This shows the high importance of industrialization of the medicinal plants variable in predicting the competitive advantage.

The third hypothesis: Investigation of the diversity of medicinal plants and their application in Zagros forests Zone can be effective in discussing the competitive advantage in other parts of the country.

The diversity of medicinal plants and their application in Zagros forests Zone cannot be effective in discussing the competitive advantage in other parts of the country. H0: $rx, y=0$.

The diversity of medicinal plants and their application in Zagros forests Zone can be effective in discussing the competitive advantage in other parts of the country. H1: $rx, y \neq 0$.

To test the lack of correlation among the model errors, Durbin-Watson statistic was used. Durbin-Watson value obtained was equal to 1.738. If Durbin-Watson statistic is between 1.5 to 2.5, the H0 hypothesis cannot be rejected, i.e. the assumption of lack of correlation among the model errors is acceptable. Therefore in this case, the lack of correlation among the model errors is confirmed.

The standard beta amount shows the importance of medicinal plants in the model. It is evident that the third hypothesis is confirmed, i.e. the significant amount for medicinal plants is less than the specified alpha value (0.05). Therefore, one can say that with 95% confidence interval, investigation of the diversity of medicinal plants and their application in Zagros forests Zone can be effective in discussing the competitive advantage in other parts of the country and approximately 3.7% of the dependent variable changes is explained by the mentioned variable ($R^2=0.037$). Therefore, the research hypothesis is confirmed with 95% confidence interval. According to beta coefficients, it can also be said that the explanatory level of the variable of the diversity of medicinal plants and their application is 19.2%. In other words, it can

be said that the variable of the diversity of medicinal plants and their application can predict the dependent variable of competitive advantage with a value of 19.2%. This shows the high importance of the variable of the diversity of medicinal plants and their application in predicting the competitive advantage variable.

DISCUSSION

According to the results of the statistical analysis, it can be concluded that the intensity of correlation between two variables of medicinal plants and competitive advantage is +40.2%. Thus, the results indicate that the first hypothesis is confirmed. On the other hand, the results showed that medicinal plants variable can explain the competitive advantage variable at a rate of 63.4%. Introduction and identification of tree and shrubs species is among the most essential fundamental and infrastructural researches in the field of natural resources and the environment. By identifying the vast majority of genetic, medical and industrial reserves of local and pristine areas such as forests in Zagros forests Zone, while using this precious wealth rationally, the conditions for sustainable use of this plant germplasm will be provided. Utilization of these genetic reserves as a valuable treasure is in the hands of human beings, and their purpose is to serve human needs. The results of testing the second hypothesis showed that the explanatory power of the variable of industrialization and production of medicinal plants required by the society even certain medications could explain the competitive advantage at 23.6%.

Paving the way for investment in the country will make great contribution to the export of medicinal plants products. Their wooden elements of forested areas and

rangelands and their habitats were previously used as fuel and for feeding animals and the development of agricultural land in Zagros forests Area respectively. Only few products were used for traditional medicine. This trend from distant past has gradually reduced the abundance and diversity of the wooden elements and limited their natural habitats. The results obtained from testing the third hypothesis showed that the variable of study on the diversity of medicinal plants in the district and their application could explain the competitive advantage at explanatory level of 19.2%. Zagros forests Zone as a result of having special climatic conditions and topography comprises about 20% of plant species of the country (including forest and rangeland species). Moreover, about 95 families, 350 genera and 1,700 flora species have been identified.

The following recommendations can be put forward which include: Legal infrastructure for inclusion of medicinal plant products should be approved by the Ministry of Health and Medical Education in the country's insurance system; Comprehensive reform of production, quality control systems, and use of drugs and herbal and natural products of the zone (human and animal) should be encouraged; Policies and regulations relating to organic pesticide plant supply industries from plant origin for the security of food safety should be developed; The development of new technologies in the production process and processing of medicinal plants should be supported; Support should be given to non-academic experts in the field of medicine and building up an appropriate basis for benefiting from non-academic therapists reserves and transferring them to the next generations; The establishment of innovation centers for Iranian medicine, museums, hotels and residences research, recreation center and village health care in the zone should be supported;

Reforming and completing comprehensive system of research, education and promotion of medicinal plants and Iranian medicine in the zone should be encouraged; A comprehensive system of research in the field of medicinal plants and natural products should be developed; Attracting state and private banks facilities for sustainable development of medicinal plants should be encouraged.

CONCLUSION

Paving the way for investment in the country will make great contribution to the export of medicinal plants products.

CONFLICT OF INTEREST

There is no conflict of interest.

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