*Original Research Article***Porter's Competitive Advantage Model and its Application in Bottled Drinking Water in Iran**

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Since the classical economics, the model of competitive advantage at different levels (national, industry, firm) has been considered attentively by experts in economics and management. In recent years, one pivotal issue in the field of management has been the identification of competitive advantage sources and the breakthrough strategies for its preservation and development. The main purpose of this article is to explain one of the popular theories concerning the competitive advantage model, that is Porter's model, to show whether it is applicable in a country like Iran, which possesses a highly dominant government-based economy, or not. Besides, if it requires any modification in its pattern, what form of modification should it comprise? In terms of methodology, thus, this may be deemed an applied developmental research. Primary data targeted was obtained by means of a quantitative survey using a questionnaire technique of data collection. The questionnaire survey took place in the period from 10/2010 to 6/2011 and a total of 109 firms (undertaking their activities in the territory of the Iran) were involved. The results of the study show that Porter's model in both the upstream and the downstream forms must become developed and rectified. Ultimately, the most advantageous shape of the model for detecting the sources of competitive advantage in bottled drinking water industry is offered.

Keywords: bottled water; analysis; survey; edge resources; Iran.

INTRODUCTION

Gaining competitive advantage is critical for organizations. Define competitive advantage as 'a product or service that an organization's customers value more highly than similar offerings from its competitors. Competitive advantages are typically temporary as competitors often seek ways to duplicate the competitive advantage (Baltzan and Phillips, 2010). In order to stay ahead of competition, organizations have to continually develop new competitive advantages.

Michael Porter's Five Forces Model is a useful tool to assist in assessing the competition in an industry and determining the relative attractiveness of that industry. Porter states that in order to do an industry analysis a firm must analyze five competitive forces (Baltzan and Phillips, 2010):

Rivalry of competitors within its industry

Threat of new entrants into an industry and its markets

Threat posed by substitute products which might capture market share

Bargaining power of customers

Bargaining power of suppliers.

To survive and succeed, a business must develop and implement strategies too effectively counter the above five competitive forces. O'Brien and Marakas (2011) suggest that organizations can follow one of five basic competitive strategies, which are based on Porter's three generic strategies of broad cost leadership, broad differentiation, and focused strategy. The five competitive strategies are: cost leadership, differentiation, innovation, growth, and alliance.

Porter's theory of national competitive advantage is based upon an analysis of the characteristics of the national environment which identifies four set of variable which

influence firms' ability to establish and sustain competitive advantage within international market. These interacting determinants from what Porters refers to as the "national diamond". Porter's contribution here is to analyze in much greater detail the characteristics of factors of production, the processes by which they are created, and their relationship to firm's competitiveness. He recognizes "hierarchies among factors" (such as natural resources, climate, location, and demographics) and "advantaged factors" (such as communications infrastructure, sophisticated skills, and research facilities). Advanced factors are the most significant competitive advantage and, unlike factors whose supply depends upon exogenous "endowment", advanced factors are product of investment by individuals, companies, and governments. The advanced factors which the most enduring basis for competitive advantage tend to be specialized rather than generalized which inevitably implies a close interaction between industry success and creation of the specialized factors of production necessary to that success (Grant, 1991).

The present article aims to specify how successfully Porter and his theory has been able to tackle problems to identify whether it can be esteemed theoretically and practically valid in a state-dependent economies like that of Iran (Moradi and Rasoli, 2007). In addition, it strives to determine what factors function as the Edge resources in bottled water industry. This pattern is important in Iran because many studies have done so far have indicated a strategic relationship between industry and development as a nation-wide trend. This approach focuses on macroeconomic planning under the supervision of central government instead of paying attention to industry and concentrating on commercial aspects of business based on the competitive model. Therefore, this paper attempts to

test the Porter's model and to provide a proper model for identifying the sources of competitive advantage in the Iran's bottled water industry.

Understanding this kind of competitive advantage cannot be possible without investigating its evolution in the past 200 years because it has been the focus of attention by classical economists, neoclassical economists and political-administrative economists. Haberler (1936) had radically changed the foundations of economic theory by developing the theory of marginal utility in place of the labor theory of value. But in the theory of international trade it was still common to demonstrate the benefits from the division of labor among nations on the basis of the labor theory of value. Comparing the relative costs in labor time for different countries to manufacture various goods showed the comparative advantage that different nations might have for specialization of production (Dos, 2001).

A fundamental difference between the classical theory of comparative advantage and competitive advantage of Porter's is that the former suggests why international trade will benefit all trading partners, while the second attempts to envision an attractive opportunity for a country within the global trading system by creating inimitable and unreachable features (Moshabaki et al., 2011).

Essential, for classical economists there is no imaginable circumstance other than perfect competition as an economic model for understanding economic mechanisms, and any analysis of the competitive situation is provided as a deviation from the ideal model. Meanwhile, recognizing the economic environment in which the monopoly grows and leads to market power for the firm was introduced in the neo-classical period, as were concepts such as industry, its actors, the creation of monopoly power and thus gaining a competitive position in the firm. However, legal entities such as companies or organizations were not much of a tangible entity for them, and sufficient time was required for the concept of organization to be developed first, and then for the company as a competitive unit to be identified, and finally for the concept of the market, along with its various kinds, to be generalized to another concept called industry; only then the way was paved for Porter to commence his work (Rasekhi and Zabihi, 2009).

The concept of the markets and the nature of Competitive advantage are key issues in digesting the viewpoints of neo-classical economists. In this regard, the following points can be worthy of mentioning (Cox and Harris, 1984).

Permanent Producers usually try to escape a situation of absolute competition by some self-devised strategies. As soon as this occurs, they require strategic variables other than productivity or output rate.

Under monopolistic competition in the market, the profit margin is always low and therefore, firms would attempt to upgrade their level to an oligopoly.

Porter's work was based on the neoclassical theory of oligopoly market and industrial organization. Many believe that Porter did nothing but utilizing the word "industry" instead of "market" in the pattern of microeconomic theory. With this simple change and applying it in various theory and research areas or in the industrial organization theory, which is based on the oligopoly situation, he managed to provide a comprehensive understanding of the structure of an industry (Husseini and Folad, 2010).

Porter tried to analyze the factors that help or hinder the companies' international operations separately, and that was a new task at the time because he viewed each company as a unique phenomenon in his studies, and attempted to bring all units of the study such as the firm, the industry and the nation into a coherent whole (Mirjalili et al., 2002).

The extent to which Porter's proposed model has been successful in this area is the main concern of the present investigation, while attempt has also been made to take the criticisms thereof into consideration.

The importance of bottled water production

The world market of bottled water has grown quickly and is considered as a global billion dollar business (Guler, 2007a, b). In the countries such as the United Arab Emirates, nearly 90% of the population drinks bottled water (Nsanze et al., 1999). The dramatic increase in the consumption of bottled water world wide has been attributed to the consumers' concern over increasing water pollution and their objection to offensive tastes and odors such as chlorine from municipal water supplies and bacterial contamination. Apart from the use of bottled water as drinking water, it has found wide usage in infant formula preparation, reconstituting other foods, also for cleaning contact lenses, skin care and filling humidifiers (Saleh et al., 2001).

Nowadays, many people living in urban areas are increasingly consuming bottled water because it is associated with "naturalness". The most common problems in household water supplies may be attributed to hardness, iron, sulphides, sodium chloride, acidity, and disease-producing pathogens, such as bacteria and viruses, and because bottled water is often regarded as safer and healthier than tap water. In many parts of the world, there is also a common belief that natural (bottled) waters have beneficial medicinal and therapeutic effects (Warburton et al. 1992).

Bottled water consumption has been steadily growing in the world for the past 30 years. It is one of the fastest growing and the most dynamic sector of all the food and beverage industry; in spite of its excessively high price compared to tap water and the presumed access consumers have to cheap and good quality tap water (Ebrahimzadeh, 2003).

Bottled water is a relatively new product in Iran, with demand still far from saturation. In fact, the low sales base

of the category was the main driver of growth in 2012 as many Iranian households are still discovering bottled water as a healthier alternative to low quality tap water. Although this product has more than 30 years' presence in Iran it was only during the first decade of the new millennium that it emerged as an everyday item in the shopping basket of the typical Iranian urban family. However, consumption of bottled water is largely limited to key urban areas where consumer disposable incomes are higher and where such products benefit from better availability, visibility and accessibility (Levallois et al., 1999). In a highly fragmented competitive environment, Damavand Bottled Water Co, which is the oldest supplier of bottled water in Iran, retained its leading position in 2012 with a 30% share of off-trade volume sales.

Bottled water is still a very immature category in Iran in spite of impressive growth over the review period, with per capita consumption estimated to be no more than 14.5 liters' at the end of 2012. This gives a clue as to the category's strong potential for growth over the next five years. The best way for manufacturers to boost sales will be to increase awareness about the benefits of packaged products compared to tap water. It is worth mentioning that the quality of tap water in Iran is experiencing a major decline due to the limitations of underground sources compared with population growth (Grondin et al. 1996).

Iran with 113 spas is one of the major manufacturers of bottled water among the countries of the region and a part of its production is exported to the neighboring countries (Ebrahimzadeh, 2010). Statistics show that the consumption of bottled water in Iran is increasing. According to Iran's customs statistics regarding the growth of domestic consumption of bottled water, the amount of the export of this product reaches from 7 million bottles in 2007 exceed to 9 millions in the year 2009. Increase in the amount of the consumption and export of bottled water in Iran over

the next few years will cause the bottled water industry to become one of the most profitable beverage industries of the country. So this issue, along with the low cost of its raw materials, will attract the attention of many investors.

Bottled water is not the exclusive product in Iran; so many companies are active in this field. Due to the increase in the consumption of bottled water from the consumer and competitiveness of manufacturing companies in the acquisition of customer satisfaction, quality improvement of bottled water has special importance. This is achieved by implementing the pervasive quality management system in manufacturing companies so manufacturing process quality control can produce high quality bottled water. The purpose of quality improvement methods is to increase market share through customer satisfaction. Customer dissatisfaction has brought remarkable direct and indirect costs for companies. So, poll of consumers provides valuable knowledge to the companies which tend to identify their weaknesses and improve their quality.

Iran increases water quality packaging products and bottled water production, is working on increasing exports to take action, therefore, in recent years, a lot of investment in the production of bottled water done.

MATERIALS AND METHODS

The aim of the article is to present the outcomes of a survey targeted at factors affecting competitive advantage bottled waters issues. In order to meet the goal of the project, an analysis of secondary resources has been carried out which generated a list of theoretical points of departure related to the topic. The article has been drawn up using scientific methods, in particular logical methods, such as analysis, synthesis, induction and deduction. Primary data targeted was obtained by means of a quantitative survey using a questionnaire technique of data collection. The questionnaire survey took place in the period from 10/2010 to 6/2011 and a total of 109 firms (undertaking their activities in the territory of the Iran) were involved. The questionnaire had 32 questions on the research topic and 4 identification questions. To evaluate the results, methods of descriptive statistics were used (statistical software SPSS 19); absolute and relative frequencies, testing of dependency between set qualitative features and dependency tests. The analysis was carried out using the Microsoft Expert Choice and SPSS programmers and Dimitel technique.

Based on the data obtained from the quantitative survey and its evaluation the advantageous factors as illustrated in Table 1, also revealed that the only criterion for distinguishing the effect of each element on industrial competitive advantage was the vertical chain. Therefore, all the elements were scored in accordance with the associated dimension

Figure 1. Distribution of Iranian bottled water companies (Yekdeli Kermanshahi et al. 2010)

Table 1. Preliminary analysis of bottled mineral water industry in Iran

Dimension of the diamond model	Diamond pattern elements Strengths of mineral water industry	Weaknesses of mineral water industry
Conditions and Factors	Abundant mineral springs Regional Development	1- Technical dependence on and the lack of Production license. 2- Weaknesses in R&D units. 3- Complexity demand in the Down stream. 4- Non-proliferation expand the scientific foundations
Demand condition	High demand for mineral Water	1- The lack of diversity in Down stream demand. 2- Weakness in the face of technological developments
The competition	Organic connection with other	1- Insufficient technical leadership Strategies in the downstream.
Role of Government	parts of the water sector Centrally planned	1- The lack of clear rules on the protection of intellectual property

along the vertical chain. The scoring method involved the extent and intensity to which each element obtained from industry surveys was able to create competitive advantage as mentioned by industry experts and executives on the questionnaire. In addition, utilizing the Dimitel technique, dimensions and elements of the developed model were simultaneously tested in order to provide a ranking of the most efficient and pivotal advantage-making factors. In this regard, the following actions were taken and subsequently organized using Expert Choice Software:

1. The experts were asked to score, in a matrix format table, the intensity of the relationship between the pattern's dimensions.
2. A relative intensity matrix governing direct relationships was prepared.
3. The relative intensity matrix of the direct and indirect relationships underwent the process of due calculations.
4. The output tables were completed.

It is important to remember that the questionnaire consisted of 36 elements taken from top-notch companies and countries as the best advantage-making elements. The degree to which each element belonged to the six-dimensional model was determined by a nine-point scale with the intensity of 7. By the aid of the questionnaires, six of the model's dimensions in the higher level and thirty-six elements in the lower were measured proportional to the degree of each element's belongingness to each dimension, and the elements of each dimension were obtained.

Porter's Diamond model assumes that the phenomena that are analyzed are classified into six broad factors incorporated into the Porter diamond, which has become a key tool for the analysis of competitiveness (Figure 2).

Figure 2. Porter's Diamond Model (Husseini and Dariush, 2011).

The Porter thesis is that these factors interact with each other to create conditions where innovation and improved competitiveness occur. The model, which provides a method to compare competitive advantage internationally, is known as a variety of normative paradigms in which the components reinforce each other, although they might function in inverse direction leading to undermining the competitiveness. This model cleverly integrates the important variables determining a nation's competitiveness into one model. Most other models designed for this purpose represent subsets of Porter's comprehensive model. However, substantial ambiguity remains regarding the signs of relationships and the predictive power of the 'model'. Also, due to the nature of the model, the relationship between the elements and dimensions cannot be separately verified (Husseini and Dariush, 2011).

RESULTS AND DISCUSSION

To achieve the purpose of the study based on its research method, it seems necessary first to convert the Porter's abstract model into an objective model appropriate for probing the bottled water industry. Then it would be feasible to rely on its results by creating tables associated with the dimensions and elements of the Diamond model. Therefore, the findings of the studies done on the bottled water industry were garnered in Table 2. The table can test the conceptual model and achieve the ultimate advantageous elements in bottled water industry and was made as a result of the following steps:

1. Reviewing the related literature
2. collecting the proper data
3. Comparing each finding with the definition of the model's main variable
4. Certifying that the specific research finding belongs to the relevant dimension of the model (through face-to face interviews)
5. Inserting each finding into the table part intended for the model's main dimensions and associating it to the element of the post vertical industry chain in accordance with the diamond patterns.

Respondents (industry elites) believe that the relationship among the six dimensions of the model have a great impact on creating a sort of effective competitive advantage. However, they also maintained that in Iran's bottled water industry the elements of each dimension, depending on whether they are at the upstream industry or downstream, pose different effects on competitive advantage. For instance, the elements for the "government" dimension within diamond pattern at upstream industry include such elements as centralized planning, encouraging competition, encouraging product variety, not interfering in decision-makings, educational investment, developing current standards, and ratifying laws against monopoly. Thus at the level of dimensions, the conceptual model is efficient; yet at the level of elements, it was necessary to adjust and categorize on the basis of the vertical cycle of industry. It ought to be added that the above elements and factors, regardless of their practical use, are considered sources of advantage in Iran's bottled water industry.

Drawing upon the above factors or parameters, an overall picture of this industry along with a progressive diamond for each section of the industry is presented. By introducing separate advantage-generating tables in terms of their

Table 2. Components and dimensions of Diamond model

Components & Dimensions of Competitive Advantage	Variables Description	Components & Dimensions of Competitive Advantage	Variables Description
A	Factors Condition	D1	Internal Decision-making
A1	Cheap raw materials	D2	Different Approaches
A2	Adequate Raw Materials	D3	Technical Leadership
A3	Regional Infrastructures	D4	Discouraging competition
A4	License development	D5	Centralization approaches
A5	Cheap and skilled human force	E	State
A6	Academic Institutions	E1	State planning at upstream
B	Financial Infrastructures	E2	Developing infrastructures by the state at upstream
B1	Demand conditions	E3	State support at upstream
B2	Planned Demand	E4	Preventing competition at Upstream
B3	Different Demands at Downstream	E5	Encouraging competition at downstream by the state
B4	Complicated Demands at Downstream	E6	Anti-monopoly laws at Downstream
B5	No State intervention	E7	Supporting copyright
C	Planned Supply and Demand	E8	Investment in Human force
C1	Related Industries	F1	Possible events
C2	Vertical Upstream Integration	F2	Innovations in technology
C3	Planned Supply and Demand	F3	Improving technology
D	Competition structure		

Table 3. Components which are sources of competitive advantage in Iran's mineral water industry upstream

Dimensions of the Model	Components
Factors Conditions	1- Production Capacity 2- Cheap raw materials 3- Abundance of sources 4- Regional Infrastructures
Demand Condition	1- Planned demand based on fee Downstream growth
Related Industries	1- Planned Supply and Demand 2- Maintaining Oligopoly Conditions
Competition Structure & Approaches	3- High Vertical Integration 1- Expenditure Leadership 2- No Competition 3- Centralization Strategy 4- Centralized Decision-making
Government Role	1- Developing Infrastructures
Possibilities	1- Controlling factors influencing changes in conditions by businesses

Table 4. Components which are sources of competitive advantage in Iran's mineral water industry downstream

Dimensions of the Model	Components
Factors Conditions	1- Technical improvements 2- Expansion of production license 3- Journeyman 4- Scientific center 5- Financial structures 6- Diverse and complex demands
Demand Condition	1- No government intervention 2- Vertical focus and lack of integrity
Related Industries	1- Special engineering companies
Competition Structure & Approaches	1- Expenditure Leadership 2- Product Type 3- Decentralized structure
Government Role	1- Market segmentation

being at upstream industry or downstream drawn from studies based on vertical cycle of the industry, provided us with the requisite raw material to form a progressive and experimental diamond (Table 3, 4).

The above tables were the results of questionnaires. Categorization was according to a procedure in which a group of experts were asked questions regarding the extent to which each element derived from industrial studies, in terms of the magnitude of its impact on generating competitive advantage at upstream industry or downstream industry respectively. In the next step all elements were classified based on the six-dimensional model.

Dimitel technique indicated that focusing on the following dimensions in Iran's bottled water industry will result in more competitive advantage. At upstream industry, the conditions of agents, the role of the state, demand

conditions, related industries, competition structure, and contingency events and factors including demand condition, competition structure, government's role, related industries, and contingency events at downstream industry.

CONCLUSION

The findings of this study shows that in the upstream industry there is a growing competition in our country's bottled water industry, and entering into world-wide competition can result in a competitive advantage at national level. It should be noted that the downstream industry experiences its initial stages, thus theses two levels are different in terms of their nature of competition. Moreover, a close scrutiny into this industry based on diamond model showed that although this model seems exhaustive in terms

of its dimensions and covers almost all relevant factors in generating advantage, the components of each dimension over the vertical cycle of industry change in nature, and one or some elements become important at a given time indicating that implementing this method involves preparing the industry profile as well. In other words, the diamond model at its highest level, that is its six dimensions, is efficient enough.

However, as far as its components are concerned, it is likely that a given dimension possesses several or different elements from one industry to another or from one country to another; this is contrary to what Porter mentioned.

Iran's bottled water industry is among those industries which, in terms of their structure, are of great importance. In these industries the components of the diamond model along the vertical cycle of the industry may undergo changes in their function. For example, factors such as the government's role at the upper level of Iran's bottled water industry cannot have the same weight or features as those at the lower level of industry. This phenomenon obliges us to design different diamonds which can generate different interactions in the vertical cycle of the industry. This shows how the analysis of previous cycles in Porter's diamond conceptual framework such as the analysis of five forces and the analysis of value has been neglected and distorted. To overcome this shortcoming in the present research, the dimensions have been kept constant in the entire vertical chain, while the elements have been categorized dynamically in accordance with their variable nature. This can be regarded as a step forward in the evolution of our approach toward competitive advantage at the national level.

In addition, it has been established that the application of diamond separated from its earlier stages, which is the structural analysis of industry and the theory of value chain, is operationally problematic. In other words, it is not possible to identify the elements in each dimension without the structural analysis of industry and its five forces. Investigating the interaction of elements and dimensions simultaneously shows that demand, competitive structure, and related industries, respectively, are much more effective than other factors such as demand conditions and the state. The demand condition is the most pivotal element in this framework, whereas the state plays an intermediate role in all cases to identify the relationship between the factors, Dimitel technique was utilized and the following results were obtained:

The agents, the government and the demand are the most influential factors in the upstream industry

The demand is the most influential factor in the downstream industry

Also, the results indicate the most important advantageous elements in Iran's bottled water industry:

1. The demand is an influential factor in both the upstream and downstream industry, but its effect is somewhat intensified in the downstream.
2. Moving from the upstream industry downward, the effects of the factors decreases, while the importance and effectiveness of such factors as related industries and competition structure increases.
3. The role of government in creating competitive advantage in upstream industry is more prominent, whereas its role in the downstream industry is supportive and facilitative.
4. Paying attention to the comprising elements of each dimension and its content illustrates that how different the major orientation of decision-makings can be in the two main sections of Iran's bottled water industry. Therefore, the Porter's Diamond may be applicable to Iran's bottled water industry provided that the model becomes developed and formed in two shapes with diverse elements. This issue has been confirmed for the first time in the present investigation. Moreover, the results demonstrate that the impact of the advantageous elements or dimensions in the upstream and downstream industries is somehow dissimilar.

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