

ORIGINAL ARTICLE

Identifying and Prioritizing of the Effective Factors on Competitiveness of Wooden Furniture Industry Using TOPSIS Method

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ABSTRACT

At the present time, most of industries manufacturing various wooden furniture goods are encountering with extended challenges in developing desired markets and entering local and international areas. One of the important reasons can refer to their non-competitiveness as an important manufacturing companies' failure in international markets in comparison with other foreign competitors. Thus, the prepared research aims to determine and rank the factors which are effective in competitiveness of wooden furniture industry by using TOPSIS method in Iran. To do so, attributive and survey research of 100 people sample in form of standard questionnaire and experts opinions in 4 main groups are used and 19 sub-indicators are defined. Significance degree of indicators and sub-indicators were determined using TOPSIS method in which main indicators such as economic, technical, material and human resource indicators have higher weighting level respectively. The Results show that the sub-indicator specified for successful design has significant advantageous comparing to other sub-indicators in this method. Sub-indicators of human resource specialist, raw material, standard development, sustainable management, sustainable supply and skill improvement have higher priorities respectively. It is concluded that attention, officials and practitioners' encouragement and more investment in designing goods must be taken as priority. According to this fact that successful design requires human resource specialists, serious supports of manufacturers and exporters of Iran furniture, removing and attracting these kind of staffs, correct planning and sustainable management are so necessary.

Keywords: TOPSIS, competitiveness, indicators, wooden furniture industry.

Received 19/03/2015 Accepted 08/06/2015

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How to cite this article:

Elham G, Ajang T, Mehran R .Identifying and Prioritizing of the Effective Factors on Competitiveness of Wooden Furniture Industry Using TOPSIS Method. Adv. Biores., Vol 6 [4] July 2015: 25-31. DOI: 10.15515/abr.0976-4585.6.4.2531

INTRODUCTION

Lack of competitiveness is one of the most important problems among industries, caused by having no specific approach to increase competitiveness [5]. Competitiveness and improving the status of various industries to survive and grow in the turbulent world markets are among the most important economic issues throughout the world. The mentioned issue has recently been considered with emphasis on the industrial development process. The statistics show that the countries in the region such as Turkey which is active in field of exporting furniture and wooden products consider Iran as their target market in regard with the Iran market. On the other hand, some of the importers have actually made Tariff protection ineffective for this product by expressing unreal and low prices in the customs of the country [12]. Competitiveness power one of the features of today's most successful business companies originated from a new perspective more than anything else. However, the time and environment has significantly changed the competitiveness indicators. Competitiveness becomes permanently applicable when it is enough flexible to fit process management and environmental changes [2]. Competitiveness is a multidimensional concept ; Organizations are forced to improve all its dimensions in order to develop their competitive power [1]. Economic liberalization, increased research and development activities as well as the development of furniture industrial clusters are among the factors developing it in the future

[10]. The volume of Iranian business transactions has been improved 10 % in the year 2007 comparing to the previous year. The volume of transactions was reported 109.8 billion dollar in 2006 that was reached to 131.5 billion dollar in 2007. According to the reports, the increase of Iranian business transactions is due to increase of exporting goods. Although Iran's exports has experienced 24% growth in 2007 comparing to the previous year, the volume of importing goods reached to 78.4 billion dollar the same year. Iran's share of total global exports is 0.567 in 2007¹, [15]. The statistics show that global trade in furniture has been reached from 42 billion dollar in 1997 to 97 billion dollar in 2007. However, Iran's furniture industry exports have been increased from 5.3 million dollar in 2007 to only 6.5 million dollar in 2008, while the rate of importing has increased from 25 million dollar to 416 million dollar during the listed years, causing the increase of the ratio of imports to exports from 5 in 2001 to more than 63 in 2008 [13]. The lack of proper understanding of the effective factors in the competitiveness of the Iran's wooden furniture industry has caused a significant increase in importing rate during the recent years [14]. According to the studies, Iran's exports of wood products have been raised until 1997 and then it has been declined. By considering the target markets, it is found that the rate of wood exports have increased when the Central Asia countries and the Caucasus have opened their markets on Iranian products. However, lack of attention to standardization issues and quality of products cause their markets to have a negative reaction toward Iranian products. The mentioned factor along with other factors such as negative competition of Iranian exporters with each other, having no vision of future, exporting low quality products and the presence of powerful rivals such as Turkey, Italy, China and Poland decreased the volume of Iran's export to the mentioned markets. Finding the obstacles and difficulties faced by furniture industry as well as the reasons for its backwardness in comparison with other countries can represent more effective solutions to operate them in the country and finally develop the exporting process. Due to the manufacturing units' potential of the industry to absorb labor force, increase in production and the development of exports can be a very good stimulus for related industries such as particleboard, fiberboards, veneer, plywood, accessories and etc. Thus, the increase in exports of wood furniture can be a stimulus for a large part of the related industries in the country. The exporting improvement has a significant role in Gross Domestic Product (GDP) growth and foreign exchange earnings [13]. Clustering is one of the best solutions presented in wooden furniture industry development. Since most of the furniture manufacturing units are in the forms of small mills in the country, they cannot be successful in export markets on their own. Therefore, by creating special industrial zones and the specialization of tasks can be an effective step to improve quality and develop Iran's furniture development [7]. Lack of sustainable policy for the production, failure to provide appropriate financial facilities for manufacturers by the banks, worn equipment and machineries as well as lack of adequate human resources specialists are among the major problems in the country's furniture manufacturing industry [3]. Failure in exporting wooden furniture as well as losing regional markets in favor of countries such as Turkey and China is rooted in factors other than a lack of raw materials and manufacturing structures. It is necessary to pay more attention to the use of knowledgeable managers, providing practical training, strong support of exporters and domestic producers and the need for innovation in different fields [5]. Technical, technological, economic and environmental are respectively 1 to 4 from the viewpoint of wooden furniture consumers. According to the results, it seems from the perspective of consumers that sub-indicators including beauty, elegance, proportion, design, mechanical resistance and strength of imported furniture are among the main reasons for the attention of customers to these products [14]. Iran's share of different products of wood furniture is only 0.02 in global market. The wooden Furniture industry suffers from mismanagement like other industries. Low quality products as well as neglecting the taste of market are among the factors that isolated Iranian furniture industry and caused increase in importing rate [15]. Wood Industries are currently faced with various challenges and unfortunately, there are no coherent and comprehensive programs to deal with them. In this regard, we always witness incomplete, contradictory and short-term solutions and in some cases even incorrect ones. Lack of cohesion, neutralizing others activities and inaction statues are among the consequences of the absence of a roadmap agreed by the various active and influential sections in this industry, imposing exorbitant costs as a result of losing opportunities for the development of the country's wooden industry and even the previous conditions. For example, tariffs on imports of furniture industry raw materials is about 30 to 40 percent which increase the furniture costs in the country and in exporting field and cause Iran furniture industry to be unable to compete with other countries. The total rate of furniture exports has been about 26 million dollars in the year of 2010 which is minimal in regard with capacities existing

¹Union exporters of Home & Office Furniture of Iran

in the country. Furniture manufacturing industry is developing in the world. Any country that has a share in the international market competition will create a big change in the mentioned industry. Since Iran's wooden furniture industry is put in the lower ranks of the global competitors, understanding all the factors affecting the competitiveness of this industry is very important. The prepared research tries to determine and rank the factors which are effective in competitiveness of Iran wooden industry by using TOPSIS method in order to develop wooden furniture industry exports and increasing the competitiveness power of producers through identifying and prioritizing the factors affecting the competitiveness of the wooden furniture industry as well as achieving regional markets which are among the industrial and economic development goals of the country. To do so, significance degree of indicators and sub-indicators were determined using TOPSIS method after initial studies, interviews and discussions with a number of wooden furniture industry experts. The obtained results are important as a guide for manufacturing companies, businessmen, exporters and export development organizations of Iran.

MATERIALS AND METHODS

The research methodology used in this study is in applied type. Furthermore, the prepared research is a compound one (qualitative and quantitative) and data are both qualitative and quantitative too. Also, this research aims to study the materials in a descriptive – survey way. It is referred to a group of wooden furniture manufacturers in order to conduct research and collect information. The research is a sectional one conducted in the year 2013. A number of companies which are active in wooden furniture industry are the place to collect required data. Field – library studies, interviews, previous researches, the previous projects, databases, papers, books, magazines and the Internet are among the method used to collect required data. Library studies and interviews with manufacturers, professors and experts try to identify the indicators which are effective in competitiveness of Iran wooden industry. The research is done in two overall stages: in the first stage, the main factors and components of research were identified through reviewing the related literature and the conceptual model were specified according to Figure 1. In the second phase, the data related to conceptual model variables were collected and evaluated through TOPSIS method.

The statistical society of the sampling was considered as classified (grouping) one. The statistical society includes the Iranian companies which are active in wooden furniture industry. The number of people was considered 135 cases which the sample volume was calculated for 100 people in regard with Kokaran formula. Then questionnaires were developed in two stages based on the mentioned indicators in statistical society. In the first phase, collected data were analyzed by factor analysis which aimed to reduce the variables. In the second phase, in order to prioritize and determine the degree importance of each of them, a standard questionnaire was planned to compare the criteria and sub- criteria and distributed in mentioned statistical society. The results of questionnaires were analyzed by using TOPSIS method in Excel software. The Alpha Crohnbach method was applied to consider the validity of questionnaire and the content validity method was used to assess its reliability. In all questionnaires, 19 indicators which are possible to be effective in country's wooden furniture competitiveness were represented in four separated material, human resource, technical, economical groups. The identified indicators were rated by industrialists, professors, experts and specialists in the form of a questionnaire. Finally, the importance rate of each sub- indicator was applied by using TOPSIS method.

TOPSIS method

This model was proposed by Huang and Yon in 1981. This model is one of the best multi-criteria decision-making models with widely usages. The number of (m) options is evaluated by (n) indicators in this model. The technique is based on the concept that the selected option must have the minimum distance with positive ideal and the maximum distance with negative ideal which are done through six following steps:

- *Having no decision matrix scale by making no scale of norms*
- *Obtaining the weighted matrix without scale*
- *Determining both negative and positive ideal solutions*
- *Obtaining the distance of each option with the negative and positive ideals*
- *Determining the relative proximity (CL) of an option to ideal solution*
- *Rating options*

RESULTS

Questionnaires were completed by 100 people who have important positions in Iranian companies related to wood furniture industry. They were all among the important persons in wooden furniture

industry, professors and experts. The validity of questionnaire was done by using SPSS statistical software and Alpha Cronbach method which the amount of 0.850 was evaluated for all of the questions. The questionnaire validated by applying content validity method based on using the knowledgeable experts' ideas. The weighted values for each effective criteria and sub-criteria are the result of decisions made by a group of experts in country's furniture industry competitiveness. In order to obtain weighed indicators, Shannon entropy method was applied which the results are mentioned in the following Table. The results obtained through considering the importance of effective indicators by using TOPSIS calculations which are mentioned in Table 2. Each option in which CL is bigger is considered better. The following results are presented in Figure 2.

5 important sub-criteria analysis based on prioritized results

Successful design: The results obtained by using two methods represent that successful design is one of the most important factors to succeed in furniture industry competitiveness. Successful design leads to creation of such products which finally reduces operating costs and production time, offerings and even product development and penetrating market.

Human resources specialist: by accurate and timely decisions, human resources specialist can compensate financial losses, create value-added for organizations and add the material investments. Thus, the priority of wooden furniture companies must be to attract and retain such employees.

Raw materials: raw material supply is the main requirement of wooden furniture industry. The imports of goods, the lack of adequate protection of domestic producers and the high cost of raw materials are among the most fundamental problems in the country's manufacturing industry. Furniture industry is also experiencing this problem and the cost of raw materials has marginalized it. According to the obtained results, supplying raw materials shows the importance of this indicator in high priorities which must be considered in head of wooden furniture industry management programs.

Standard development: Weakness of domestic standards compared to international ones is one of the factors preventing improvement in wooden furniture competitiveness field which the calculated results show its importance.

Sustainable management: wooden furniture industry requires a serious management and a basic strategy to compete in global markets. For this purpose, a comprehensive review to identify the strengths and weaknesses of the country's furniture industry as well as fixing existing defects can solve the problems. It shows the importance of paying more attention to this category.

DISCUSSION

The overall incompatibility rate of matrixes is less than 01.0 according to the results indicating that the results are reliable with high compatibility. The results show that economic, technical, materials, human resource indicators are respectively among the main indicators with high priorities. On the other hand, the successful design sub-indicator has significant advantageous comparing to other effective sub-indicators in the country, indicating the significant effect on the competitiveness of the country's wooden furniture industry. Human resources specialist, raw materials, standard development, sustainable management, sustainable supply and skill improvement sub-indicators have the high priorities respectively. The obtained results are important as a guide for manufacturing companies, businessmen, exporters and export development organizations of Iran. In a research study in Turkey, they concluded that production and marketing high expenses cause domestic wooden furniture lose its competitiveness power compared to similar foreign products [4]. Many researchers have described wooden furniture industry problems and failure to compete in global markets in their articles which the main results include lack of wooden raw material, new technologies, human resources specialists and etc which are generally related to products manufacturing [9,11]. Paying attention to the valuable results obtained by this study shows that in addition to raw material shortages, lack of human resource specialists and lack of other effective indicators like successful design all require special consideration. Most efforts are done to promote and improve the successful design in the field of wooden furniture industry. A large part of the ravages in the context of promoting competition are not related to manufacturing. It requires further review and attention to knowledgeable managers, practical trainings, serious support of government for exporters and domestic producers, and the need to successful design, sustainable management and standard development in wooden furniture competitive market. Desired and economical raw material is required to manufacture high quality products and consequently export Development. Therefore, the high prices of domestic wooden furniture are as the result of proper raw material shortages with low prices [15]. Reduced tariffs on imports of raw materials will decrease wooden furniture costs. In a developing country like Iran, it is not possible to have eternal or long time economic stability. Therefore, investing in such industries faces with high risks as wooden furniture is not one of the necessities in

people life. In this case, the government can make the inclination of domestic and foreign investors toward in this industry through implementing solutions, such as giving loans to support manufacturing trend with useful and long-term insurance for investors, observing justice of taxation or tax breaks, precise control of the import and export of furniture and their prices. According to a study conducted by the World Bank, economic instability is also an important factor in preventing development of various industries [6]. Lack of attention to standard issues and quality of products led to negative reaction of global markets toward Iranian products. This factor along with other factors like lack of vision of the future, export of low quality products and strong presence of competitors such as Turkey, Italy, China and Poland decreased the export volume of Iranian products to their markets [12].

Table1. Results of measures weights

$W_j = \frac{d_j}{\sum d_j}$			
economic factors	technical factors	materials	Human recourses
0.2591	0.3427	0.2298	0.1684

Table2. The results of orders

Order	CL _i	Factors
1	0.9493	Successful design
2	0.6867	Human resources specialists
3	0.6807	Raw materials
4	0.5627	Standard Development
5	0.5212	Sustainable management
6	0.4870	Sustainable supply
7	0.4243	Skill Improvement
8	0.3940	Liquidity
9	0.3862	Branding
10	0.3854	New Product Development
11	0.3676	Advanced technology
12	0.3340	Research and Development
13	0.3469	Marketing
14	0.3701	Equipments
15	0.1698	Economic stability
16	0.1473	Customer satisfaction
17	0.1102	Strategic planning
18	0.0983	Motivation
19	0.0662	Reduced prices

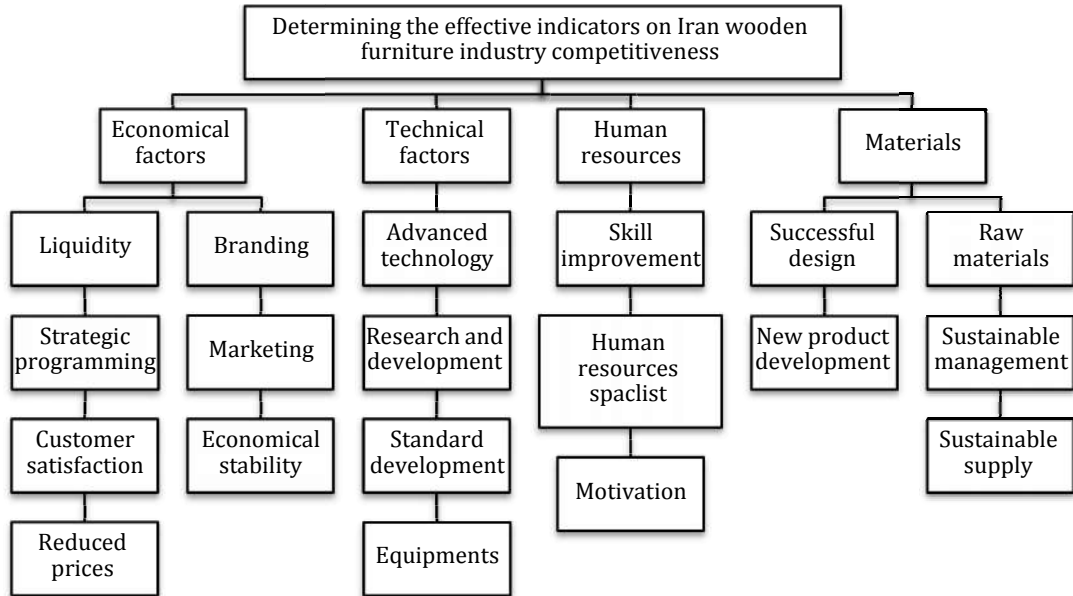


Figure 1: The conceptual model

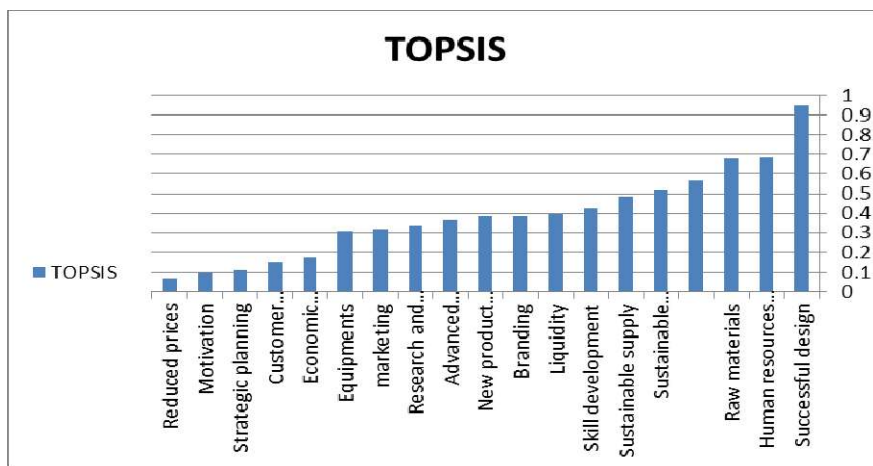


Figure2. The preferences results calculated through TOPSIS method

SUGGESTIONS

The obtained results help to increase competitive power of domestic manufacturers by identifying and prioritizing the effective factors in competitiveness of wooden furniture industry.

- According to the importance of successful design, more investment and government support to domestic manufacturers must be seen in this field.
- Government serious support for Iranian furniture manufacturers and exporters.
- Attracting and retaining human resources specialist in companies producing wooden furniture.
- By applying required standards in wooden furniture manufacturing and forcing some of them, we can prevent low quality products in the country and for the exports.
- The arrival of new technical and managing technologies and the increase of proficiencies and human resources skills in Iran's wooden furniture industry.
- More efforts done by Iranian manufacturing companies to have domestic and foreign marketing due to the increasing intensity of competition in domestic markets.
- Improving foreign relations with other countries.
- Holding training courses, the presence of Iranian producers in the business environment of leading countries such as Italy and exchange of experience with world class professionals.
- Practice at the current time to present best products and services to domestic customers, decreasing the distance to wooden furniture global standards and preventing customers' dissatisfaction after presence of foreign competitors.

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