

Review and Prioritization of Export Promotion Programs on Export Performance of Top Export Companies Using Fuzzy Promethee

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Abstract

Export plays a direct role in economic development and growth of a country and therefore, several state and nonprofit organizations in Iran support export activities of companies using various export promotion programs. In order to evaluate and Prioritize export promotion programs on the export performance of top export companies using fuzzy Promethee method of a survey causal method within top export companies in Mazandaran province. Statistical population of this research is the top managers and basic managers of top export companies of Mazandaran province and the research method is applied-survey type and the data analysis is performed by multiple regression statistical tests and prioritizing factors is done by Promethee method and fuzzy logic, the results of data analysis shows that advertising, sales growth, direct marketing, individual sales affects export performance of top export companies and the order of prioritization and ranking them, using fuzzy Promethee method, are advertisement, public relations, direct marketing, sales promotion and personal selling respectively.

Keywords: Export promotion programs, multiple criterion decision making methods, fuzzy logic Promethee method

Introduction

Export plays an important role in economic development of a country. Analysis of the condition of forty one countries between the years 1963 to 1985 by World bank shows that, financial performance of countries with external economy almost in all aspects is better and higher in all introvert economies (World bank report, 1987). At the level of institution, export provides growth and development opportunities for

companies. By expanding access levels to foreign markets, a company can reach higher level of production. This fact causes the reduction of total price of the organ and access to higher profit rates. Export provides the opportunity for variety in markets for companies. Also, it allows companies to make use of different growth rates in different markets and reduces a company's dependence on a specific market.

Export provides the opportunity for the company due to the competition and causes the company slowly achieve the ability to survive in unfamiliar and strange environments (Zinkuta, *et al.*, 1996). Due to the importance of export, states usually support export activities of companies by applying enticements and support programs which are called promotion or encouragement programs. The aim of these services and attempts is to help active companies in an economic area to start or continue international activities (export). A group of these programs provide companies commercial and export information, others are presented aimed to provide or increase motivation in companies for export and a large part also includes financial and operational support (such as export financial support, export insurance, export transport insurance, foreign business mission implementation, providing business relations with foreign businessmen) (Franchiz *et al.*, 2004).

Theoretical foundations and review of literature

At the present economic condition of Iran, export development is one of the most important political and economic issues that country's authorities should take into account. Therefore, awareness of enticing policies enacted in the world and also analysis of rules and regulations in order to encourage and enhance the development of export in the country is essential. Export development not only in terms of its exchange provision,

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but also from the viewpoint of employment generation within the country has a special priority. Luckily, today authorities and even people know that real advancement and stable economy in the country is largely dependent on economic development and getting secure markets in different countries. According to the first and second program objectives of economic, social and cultural development, Iran is placed among large exporters of most of important strategic and industrial products like; copper, Iron, Aluminum, cement, chemical fertilizers, petroleum products, various types of serum and drugs and many other commodities, but its main precondition is to have stable export policies. Developing non-oil exports was welcomed and taken into consideration by many economic experts and from theoretical and practical point of view experienced many successes and failures. It is clear that, large countries like Iran which benefits rich natural resources should be able to have a specific place by production and export of non-oil products in the world, especially in the Middle East; but during past fifty years, oil is not only the most important export good, but also is the effective factor and dictating the economic programs and transformations of Iran. Mahmud Motevaseli *et al.*, (2009) in an article titled “the effect of export promotion programs on the export performance: an study on the electricity industry” found out that export promotion programs generally do not directly affect export performance of companies, but indirectly and through impacting export strategies affect export performance. Despite rejecting the direct relationship between the amount of awareness and use of export and export performance enticing programs, results of their study indicates that awareness and use of export enticing programs by influence on the strategy of export affects export performance.

Ali Sanayeie *et al.* (2008) in an article titles “ranking industrial activities of Isfahan province by having proper opportunity and high potential, have the ability to create the highest value added of the industrial sector after Tehran province and in this regard it is placed in the second place among twenty eights provinces of the country. Also, the investments in this sector puts Isfahan province among the top five provinces, with regard to investment value in the years under study

Abdullah Asghar Zadeh *et al.* (2007) in an article titled “prioritizing effective factors on the inefficiency of the policy of bestowing export awards from the view of top export companies with an approach towards AHP” found out that from exporters’ point of view although three criteria of delay in giving the awards, its low amount and administrative bureaucracy, as the most important effective factor in this

policy, has almost similar effect on the inefficiency of this policy but prioritization of administrative bureaucracy and delay in paying the award compared to the low amount of award doubles the consideration of reform in export award payment method.

Hasan Vali Beigi (2006) in an article titled “prioritizing target export markets and barriers of presence in them; a case study: A selection of food export products” identified target markets and barriers to the presence in them according the evident comparative advantage measure and choose some food export products and priority markets for them with TOPSIS methods and barriers to participate in the above mentioned markets including microbus and chemical, health standards and tariff constraints are also examined.

Yahya Fat’hi (2005) in an article named “identifying relative advantages and ranking target markets of exporting decorative stones of Iran” found that although the export value growth of the goods under study is slower than its weight growth, totally a rather suitable trend is shown compared to total non-oil exports. On the other hand, with regard to the relative advantage of Iran’s exports in the goods under study, the possibility of developing Iran’s decorative stones is more than amounts exported before.

Vilxon *et al.* (2006) in an article titled “trade and export performance promotion SME” found that export encouragement, instead of direct influence on the export performance of the company, in a process and indirectly affect the export performance.

Lags and Montgomery (2005) in an article titled “the relation between export help and improvement of the performance in export markets of Portugal” in analysis of the relation between export support and export performance shows that export support have a direct effect on export performance improvement, but this effect is not significant; since this positive effect is balanced because of the negative effect of price compatibility with foreign market conditions.

Francis and Dad (2004) in an article titled “the effect of export promotion programs on competition, strategy and performance of companies” shows that application of export promotion programs influence the realization of export goals and export strategies and also lead to the promotion of international market capabilities of Canadian companies.

Gentork *et al.* (2004) in an article titled “the impact of using export help plan in the export performance” found that applying export promotion programs influence the relationship between export involvement and export performance (indirect impact on the export performance). These two re-

searchers in their empirical studies concluded that applying export promotion programs do not impact the efficiency of export but affect the competitive position of company in international markets.

Leonid *et al.* (2002) in an article titled “determiners of marketing strategies of export performance”, by analyzing thirty six empirical studies, categorized effective factors in successful export performance to five groups. These factors included: management factors (personal, experience, attitude and perception, behavioral and characteristics of decision makers of export companies), organizational factors (elements related to characteristics, operation, sources and objectives of organization), environmental factors (factors that shape massive performance environment of export companies), targeting export markets (identifying and selecting international target markets) mixed variables of marketing (product strategy, price, distribution and promotion).

Singer (1990) in an article “the role of export promotion in export management” found that export promotion policy is an eccentric approach in policy making of international trade whose aim is to help development and welfare of society by helping the increase in export to other countries. Most governments, in the framework of this policy, apply various export enticing and promotion programs with the aim of motivating companies to export. These programs are divided into two groups regarding the role they play. The first group are the programs that provide companies with information and the second group provide opportunities for companies to practically learn export.

Research question

Main research question: How is the impact of export promotion programs on the export performance of top export companies?

Secondary research questions:

- How do general relations influence the export performance of top export companies?
- How does propagation influence the export performance of top export companies?
- How does direct marketing influence the export performance of top export companies?
- How does sale promotion influence the export performance of top export companies?
- How does in person sales (personal sales) influence the export performance of top export companies?

Methodology

This research regarding development objective and collection method is survey and causal. Questionnaire is used for data collection in this research. This questionnaire was developed by analyzing theoretical foundation and after interview with 50 senior managers of export companies and managers and experts of government agencies responsible for encouraging and supporting export development. To examine the quality of this tool, two criteria of reliability and validity was analyzed. The concept of validity and reliability of the tool means the measurement tool give similar results in similar condition, in other words, reliability is basically related to stability, coordination, precision and predictability of research findings. In this research to examine validity of questionnaire, Cronbach’s alpha measure was used. After this stage, to rank and prioritize the options under study, we used Decision lab software which uses Promethee method. Statistical population of this research were elites (senior managers, middle managers of three top export companies were companies of Mazandaran province i.e. Kaleh, Dusheh Hezar, Hokland) that were experts in strategic planning and meanwhile influential in organization and have decision power in organization. In this research with regard to sample size, the sample under study were 50 people who were selected through Kergesi and Morgan table. In this research, in order to collect data, questionnaire was used. In the present research, conceptual reliability and validity was used. Because conceptual validity is not possible, or it is hard to conceptually validate a size or structure empirically or by experience and in fact through evidence or criterion the researcher try to show it is valid to measure a concept (Khaki, 2003, P.288). In order to examine internal reliability of questionnaire, Cronbach’s alpha coefficient’s reliability measure was used and analysis of collected data was done by SPSS software in two descriptive and inferential methods and in order to prioritize and rank the options, we used fuzzy Promethee method and decision lab software.

Results and Discussion

Demographic findings

Demographic findings of this research are presented in table 1:

Table 1. Demographic findings

Age	Frequency	Percentage
30-35	24	48
35-40	8	16
40-45	6	12
45-50	5	10
50 and above	7	14
Education level	Frequency	Percentage
Diploma	2	4
Associate Degree	4	8
Bachelor	21	42
MA and above	23	46
Gender	Frequency	Percentage
Male	28	56
Female	22	44
Total	50	100

Table 3. ANOVA test

Significance level	F	Square mean	Freedom grade	Square mean	Model
		2.206	5	11.029	1 Regression
	4.646	.475	44	20.891	Remaining
.002 ^a			49	31.920	Total

By looking at table 4, regarding the significance of F (4.646) at the error level lower than 0.05, it can be concluded that regression model of research is composed of 5 independent variables and a dependent variable (export performance) which is a perfect model and a collection of independent variables can explain export performance changes.

Table 4. The correlation coefficient R

correlation coefficient R	Determining coefficient	F	Significance level
0.588	0.271	4.646	0.002

The effect of propagation variables, sales development, direct marketing and personal sales on the export performance of export companies is significant, but variables of general relations for its error level of t is higher than 0.05, do not influence export performance variable. It can be claimed that per one increase in standard deviation in variables of propagation, sales development, direct marketing and personal sales, the level of export performance

Statistical findings

According to research findings, the correlation coefficient amount (R) between variables equals 0.588 which shows there is an average correlation between series of independent variable and dependent variables (export performance). Table 2 indicates the results.

Table 2. Summary of regression models

Error	Modified R Squared	Squared R	R	Model
0.6890	0.271	.346	0.588	1

The amount of modified determining coefficient equals 0.271 percent of the total export performance of top export companies dependent on the 5 independent variables mentioned in this research.

of companies raises up to 0.070, 0.272, 0.467, 0.094 of standard deviation. Thus, it can be concluded:

- Propagation influences the export performance of top export companies.
- Direct marketing influences the export performance of top export companies.
- Sales promotion influences the export performance of top export companies.
- In person sales (personal sales) influences the export performance of top export companies.

Table 5. Standardized regression coefficient β

Variable	Standard regression coefficient β	t	Significance level
Propagation	0.070	3.499	0.000
Sales development	0.272	2.950	0.04
General relations	-0.055	-0.384	0.703
Direct marketing	0.467	3.238	0.002
Personal sales	-0.094	-3.673	0.005

Suggested approaches for better export performance in export companies should be in line with paying attention to variables of propagation, sales development, direct marketing and personal sales.

Now for ranking and prioritization of effective factors on the export performance of top export companies we use Promethee method described in previous chapter using Decision lab fuzzy stage:

In this stage, the value under study has become fuzzy for all indicators. To make fuzzy this variables a five scale was used in the order; very little, little, medium, much, very much.

Table 6. Scoring Indicators (VL = 1, L = 3, M = 5, H = 7, VH = 9)

General relations				
	COL1	COL2	COL3	
C1	Speech power	VH	M	L
C2	neatness	VH	L	M
C3	Education level	H	L	M
C4	Personal characteristic	M	M	H
Propagation				
C1	SMS	VH	M	L
C2	Shopping centers	VH	H	M
C3	Weblog and website	VH	M	L
C4	Advertisement cards	H	L	M
C5	gifts promotional	VH	M	H
C6	Lottery	H	VL	VL
Direct marketing				
C1	Marketing by post and catalog	VH	VL	M
C2	Distant marketing	VH	M	H
C3	TV marketing	VH	VL	L
C4	Electronic purchasing	H	VL	M
Sales development				
C1	Cash discounts	VH	H	M
C2	Sample sending	VH	M	L
C3	Packages containing several goods with one price	VH	M	L
LC4	Special goods	VH	H	L
C5	Bonuses	VH	M	L
C6	Lottery and betting Prizes	VH	VL	M
In person sale (personal sale)				
C1	Announcing the best time for sales	VH	H	VH
C2	Restating method (speech skill)	VH	M	M
C3	Attitude	VH	M	M
C4	Treatment	VH	M	L
C5	Appearance	VH	L	VL

In the above table, Col1, Col2, Col3 respectively indicate that 3 top export companies are Kaleh, Dusheh hezar and Hokland. We write a summary of the above table as a separate table as the one below (it should be noted that the numbers in this table are the average of the numbers in different columns of the table above).

Table 7. Advantages given to the top export companies (Source: research findings)

		Companies		
		Kalleh	Dusheh	Hokland
1	General relations	7.5	4	5
2	Propagation	8.33	4	4
3	Direct marketing	8.5	2	5
4	Sales development	9	5	3.6
5	In person sale (personal sales)	9	5	4.6

Determining decision making matrix and normalization

Deciding some indicators is usually formulized by the following matrix:

Table 8. Multiple indicator decision making matrix (source: Mohammad Moradi et al. 2009)

Indicators/Options	X1	X2
A1	r ₁₁	r ₁₂	r _{1n}
A2	r ₂₁	r ₂₂	r _{2n}
.			
.			
.			
A _m	r _{m1}	r _{m2}	r _{mn}

As A_i shows the option i, X_j shows indicator j and r_{ij} shows the value of j indicator for I option (Asghar Poor, 2002). Decision making matrix obtained with regard to cases above is as the following table:

Table 9. Decision Making matrix (Source: research findings)

Indicators/Options	Kalleh	Hokland	Dusheh
General relations	7.5	4	5
Propagation	8.3	4	5
Direct marketing	8.5	2	5
Sales development	9	5	3.6
In person sale (personal sales)	9	5	4.6
Σa _{ij}	42.3	20	22.2

Σa_{ij} is the total of elements of different columns

And with regard to normalization formula mentioned, normalized decision making matrix is as follows:

Table 10. Decision Making matrix (Source: research finding)

Indicators/Options	Kalleh	Hokland	Dusheh
General relations	0.177	0.2	0.225
Propagation	0.196	0.2	0.180
Direct marketing	0.200	0.1	0.225
Sales development	0.212	0.25	0.162
In person sale (personal sales)	0.212	0.25	0.207

Blocks of this matrix is made through dividing each blocks of the previous matrix by total obtained from each column. After this stage, weights should be calculated by Shanon entropy that weights are calculated as follows:

Step 1: calculating P_{ij}

$$P_{ij} = \frac{a_{ij}}{\sum_{i=1}^n a_{ij}}$$

Step 2: calculating entropy E_j

$$E = -K \sum [P_{ij} \ln p_{ij}]$$

$$K = \frac{1}{\ln m}$$

Step 3: Calculating the amount of uncertainty d_j

$$d_j = 1 - E_j$$

Step 4: calculating weights W_j

$$W_j = \frac{d_j}{\sum d_j}$$

M in this formula is the number of options.

$$K = \frac{1}{\ln(m)} = \frac{1}{\ln(5)} = \frac{1}{1.609} = 0.621$$

$$E = -K \sum [P_{ij} \ln p_{ij}]$$

$$E1 = -0.621 [0.177 * \ln(0.177) + 0.196 * \ln(0.196) + 0.200 * \ln(0.200) + 2 * 0.212 * \ln(0.212)] = 0.996$$

$$E2 = -0.621 [2 * 0.2 * \ln(0.2) + 0.1 * \ln(0.1) + 0.25 * \ln(0.25) * 2] = 0.996$$

$$E3 = -0.621 [0.225 * \ln(0.225) * 2 + 0.180 * \ln(0.180) + 0.162 * \ln(0.162) + 0.207 * \ln(0.207)] = 0.994$$

$$d_j = 1 - E_j$$

$$d_1 = 1 - E_1 = 1 - 0.996 = 0.004$$

$$d_2 = 1 - E_2 = 1 - 0.996 = 0.004$$

$$d_3 = 1 - E_3 = 1 - 0.994 = 0.006$$

$$W_j = \frac{d_j}{\sum d_j}$$

$$\text{Weight of indicator 1 } W_1 = \frac{d_1}{\sum d_j} = \frac{0.004}{0.014} = 0.28571$$

$$\text{Weight of indicator 2 } W_2 = \frac{d_2}{\sum d_j} = \frac{0.004}{0.014} = 0.28571$$

$$\text{Weight of indicator 3 } W_3 = \frac{d_3}{\sum d_j} = \frac{0.006}{0.014} = 0.42857$$

Then, we rank the weights calculated by Decision Lab software which uses Promethee method. First we create the following formed matrix by adding ACTION and Criterion buttons in Decision Lab software.

Options are considered as Actions and indicators are considered as Criterion.

Table 11. Decision Making Matrix of Decision LAB software input

No	Indicators/Options	Kalleh	Hokland	Dusheh
1	General relations	7.5	4	5
2	Propagation	8.3	4	4
3	Direct marketing	8.5	2	5
4	Sales development	9	5	3.6
5	In person sale (personal sales)	9	5	4.6
	Σa_{ij}	42.3	20	22.2

Regarding the cases mentioned above, we have: Second option ranked first in ranking or prioritization.

First option ranked second in ranking or prioritization.

Third option ranked third in ranking or prioritization.

Fourth option ranked fourth in ranking or prioritization.

Fifth option ranked fifth in ranking or prioritization.

Table 12. The final output of the Decision Lab

No	Indicators/Options
1	General relations
2	Propagation
3	Direct marketing
4	Sales development
5	In person sale (personal sale)

Conclusion and Recommendations

Since propagation has the highest priority in affecting export performance of top export companies in Mazandaran Province, the following recommendations are given in relation with propagation variable.

- Using more effective advertisements to introduce products
 - Providing brochures with more attraction for attracting more customers
 - Providing various popular advertisement films for different ages
 - Providing professional magazines compatible for every profession regarding needs and skills of different professions
 - Applying large colored advertising posters which can convey the meaning at a glance and transfer the message.

Since sales development is the second priority in affecting the export performance of top export companies in Mazandaran province. The following recommendations are given in relation to sales development variable.

- Giving gift as complementary goods for products to customers for their constant purchase
 - Providing codes and or cards of company in a lottery that customer receives after purchasing the product.
 - Giving discount in events such as company's anniversary.
 - Giving samples of products to customer experimentally and freely to introduce the product and attracting customer

Since general relations have the third priority in affecting the export performance of top export companies in Mazandaran province, the following recommendations are given with regard to the variable of general relations.

- Effective presence of the company in seminars, fairs and international conferences and priority markets
 - Company's presence in cultural artistic activities and also mass media
 - Effective activities of the company in publishing professional magazines and news letters
 - Connecting to local distribution channels
 - Sponsoring popular activities which are held as charity ceremonies etc.

Since direct marketing is of fourth priority in affecting export performance of top export companies in Mazandaran province, the following recommendations are given with regard to direct marketing variable.

- Using electronic and internet services regarding advances of today's world in this field.
 - Online sale and using global communication facilities like facebook, email etc.
 - Holding propagation campaigns by the presence of famous people like writers, artists, etc.
 - Giving catalogues of products through weblog or email.

Since personal sales is of the fifth priority in affecting export performance of top export companies in Mazandaran province, the following recommendations are given with regard to personal sales variable.

- Holding meetings and conferences with the customers' presence.

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