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Effect of Marketing Strategies on Export Performance of Agricultural Products: The Case of Saffron in Iran

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ABSTRACT

The trend of export in some developing countries such as Iran shows that, in addition to exogenous factors such as exchange rates volatility and government policies, endogenous variables also affect the volume and value of products export. Among endogenous factors, the role of marketing strategies is very important. In the current study, the role of marketing strategies of market penetration, market development, product development, and differentiation on the export performance of saffron exporting companies in Khorasan Razavi Province in Iran was investigated using spatial panel data regression model. In order to calculate the export performance index, the four components of firm's profitability, sales volume, sales growth, and export intensity were considered. Data and information used in the study were obtained from a census of 14 saffron exporting companies during 2011-2016. The results show that marketing strategies of differentiation, market development, and product development had a significant positive effect on the export performance of saffron companies in Iran. Therefore, by applying appropriate marketing strategies in different markets, export performance could be enhanced.

Keywords: Export intensity, Exporting companies, Market development, Panel data model.

INTRODUCTION

The experience of developed and developing countries show that economic reliance on exporting a limited number of raw products such as crude oil or some raw agricultural products lead to instability of export earnings and the consequent problems such as Dutch disease (Bresser-Pereira, 2008). Export concentration reflects the degree in which a country's exports are concentrated on a small number of products or a small number of trading partners (Resilience, 2011). Therefore, to reduce the dependence of developing countries on exporting of crude products and turning into high value-added exports, export-oriented policies should be changed toward non-raw commodity exports including high value-added agricultural product exports and a high number of trading partners (FAO, 2016). This would not happen unless export opportunities in the agricultural sector are identified and changed to the operational aspects.

Export of non-raw products has more stability and it can create more employment in the related industries (Shayah, 2015). Moreover, export diversification is important because it would reduce the variability of the export earnings of developing countries (Lyakurwa, 1991). Lewis (1980) showed that diversification of exports will help countries achieve and maintain a high level of economic growth. According to the World Trade Organization (2010), diversification of export would increase local production, employment, income and economic growth. Osuntogun *et al.* (1997) also emphasized that the core of the export-led strategy is the diversification of export products and export markets.

The export sector in many developing countries has failed to be well-developed due

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to the lack of efficient and appropriate marketing and commercial systems (Basu and Monica, 2011). Although there is a growing body of literature that suggests export problems are industry-, state-, time-, and even country-specific, most of the export problems for small and medium-sized firms in developed and developing countries have similarities (Ghauri *et al.*, 2003).

In many developing countries, agricultural exports could not find their appropriate markets due to lack of appropriate marketing strategies (Carter, 1997). This fact manifests the necessities for attention to appropriate marketing strategies in the export of agricultural products.

Marketing strategies have the fundamental goal of increasing sales and achieving a sustainable comparative advantage. Sustainable competitive advantage, as proposed by Porter (2008), is achieved through cost management, differentiation of products or services, and focus on a special part of the market or a special group of consumers. While the aim of these strategies is to maximize profit, each of the various strategies applies a different method of maximization. Marketing strategies for achieving comparative advantage are market penetration strategy, market development strategy, product development, and diversification strategy (Porter, 2008).

A company that follows the market penetration strategy tries to increase its share in the current market. Price penetration, increased promotions, increased reach and usage are some tactics for market penetration strategy. Market development includes a variety of ways to attract new customers to the present goods including expanding the potential market through new users or new uses. New users can be defined as new geographic segments, new demographic segments, new institutional segments, or new psychographic segments. Product development strategy includes the creation of new products for existing markets. Several tactics such as developing new features, developing different quality levels, and improving technology are important tactics for product development strategy that will help the company attract customers and convert them to becoming brand loyal. Finally, diversification tries to increase selling through the introduction of new products in new markets (Porter, 2008).

Competitiveness of global markets in one hand, and having a comparative advantage in agricultural products, on the other hand, indicate necessities for paying attention to suitable marketing strategies for export development and increasing the share of agricultural products in non-oil exports of the Iranian economy.

Application of appropriate marketing strategies to promote the export of agricultural products is an important tool for increasing foreign trade balance in developing countries such as Iran.

Although marketing strategies are among the main determinants of export performance, little attention has been paid to the factors affecting export-marketing strategies (Brodrechtova, 2008). Koh and Robicheaux (1988) examined the impact of export marketing strategies on export performance in an industrial setting. Their results showed that, between ten export- marketing variables investigated, only three variables of export pricing, direct buyer, and channel strategies had impact on export performance. Baldauf *et al.* (2000) showed that in addition to firm size, the most promising predictors of export performance are management's motives to internationalize and the use of a differentiation strategy. Cieślik *et al.* (2015) examined the impact of internationalization experience and market scope strategy on the export performance and concluded that a firm's export experience and export performance have an inverted S-shaped relationship.

Nashwan (2015) emphasized that marketing strategy has been a tool for attaining the overall firm performance and his results show that marketing strategies have an impact on sales, customer, and financial performance of firms. Wu *et al.* (2010) found that, in the case of appropriate use of marketing strategies, exporting firms would achieve a

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sustainable competitive advantage in the international arena. Wang *et al.* (2015) suggested that export performance is directly related to trends in export markets. Erdil and Özdemir (2016) investigated the effects of firm characteristics and marketing mix strategies on export performance and their results indicate that firm characteristic, environmental characteristics, international experience, and international commitment are linked to higher levels of export performance in Turkish clothing export firms.

Leonidou *et al.* (2002) showed that, although many marketing strategy variables demonstrate positive effects on overall export performance, the relationship is not always significant. Jalali *et al*. (2011) showed that food companies' ignorance of customer needs and lack of appropriate design and implementation of marketing strategies that are suitable for export markets are the most important problems in food exports in developing countries such as Iran. Hosein Zadeh Shahri and Gholami (2014) suggested that companies that have better marketing strategies for export have a higher export performance. Morgan *et al.* (2012), indicated that effective implementation of export marketing strategies has a positive effect on financial performance.

Review of the literature showed that there is not enough empirical research about the effects of marketing strategies on the export performance of agricultural products. One major reason for the absence of sufficient studies in this field is the lack of appropriate indices for marketing strategies and export performance. Therefore, in the current study, we aimed to use appropriate indices for marketing strategies and export performance to investigate the effects of marketing strategies on the export performance of saffron companies in Iran using the spatial panel data approach.

Saffron, one of the most expensive agricultural and medicinal product of the world, has a special place in Iran's exporting goods. Saffron is a strategic product in the southern Khorasan and Khorasan Razavi Provinces, as it can help create seasonal and permanent employment for individuals, prevent migration, generate income, and expand non-oil exports. It should be mentioned that more than 85 percent of the world production of saffron belongs to Iran, furthermore, around 80 percent of Iran's total production of saffron is produced in the two mentioned provinces (Kashefi, 2016). According to Ghodoosi *et al.* (2016), although Iran is the largest saffron producer in the world, it has not been in a suitable position in the highly competitive world market today. Iran's saffron production figures show that in 2012, about 200 tons of saffron was produced in Iran, increasing to 350 tons in 2016. Despite increasing saffron production in Iran, exports of saffron decreased in recent years. One of the main reasons for decreasing exports despite production increase is the lack of attention to the principles of marketing in the production and export of saffron, which in the long-run can greatly reduce Iran's share in the global markets.

As Table 1 shows, the share of saffron export by Iran in 2011 was 78 percent of total saffron export in the world, while in 2016 its share decreased to 42 percent. Entrance of new competitors such as Afghanistan and Portugal, the increasing market power of Spain, lack of powerful marketing and export strategy for Iranian exporters, bulk export of Iranian saffron, lack of a professional and dynamic trade organization, lack of an

Table 1. Value of saffron exported by different countries during 2011-2016 in thousand USD.

Exporters	2011	2012	2013	2014	2015	2016
World	374688	194304	179045	196425	215056	222781
Iran	292432	106000	90290	99083	110432	93043
Spain	50283	51423	47315	47516	47160	65811
Other countries	31973	36881	41440	49826	57464	63927

Source: Trademap, 2017.

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accredited brand, and packaging problems are the main reasons for the declining share of Iranian saffron exporter (Mohammdi *et al.*, 2017). Furthermore, according to the statistics of Trademap (2017), Spain, UAE, Italy and United States are the largest importers of the saffron in recent years. Spain is the largest importer of saffron and in 2011 its share was 14.5 percent of the total saffron imports in the world, while in 2016 its share increased to 24.6 percent. Becoming the first importer and the second exporter of saffron indicates that Spain creates more value added in the saffron industry in comparison to other countries.

According to Torkamani (2000), problems of production, processing, and marketing of saffron in Iran has led to an inappropriate situation for Iranian saffron in international markets. despite the good quality of Iranian products. Abbasi (1999) also showed that Iran's saffron export decreased because of lacking proper marketing strategies.

Since export expansion of agricultural products including saffron, for which Iran has a comparative advantage in production, is one of the most important issues in Iran's agricultural economy, study of the factors affecting export of saffron is an important issue. Therefore, the main objective of this research was to examine the impact of marketing strategies on the export performance of saffron exporting companies in Khorasan Razavi Province in Iran. If marketing strategies have a positive impact on export performance, then by using these strategies appropriately, it would be possible to increase saffron export and its indicators in the country.

The main hypothesis of this research was that applying marketing strategies by saffron exporters could improve the export performance indicators. Therefore, we aimed to investigate the impact of using marketing strategies including market penetration strategy, market development strategy, product development and diversification strategy by saffron exporting firms on their export performance indicators using spatial panel data approach. Creating suitable measures for marketing strategies in the saffron exporting companies using the previous studies, quantifying export performance indices and relating them to the marketing strategies and, finally, applying spatial panel data regression approach in the field of agricultural marketing studies are among innovations of the current study.

MATERIALS AND METHODS

Data and information necessary for investigating the effects of marketing strategy on saffron export performance were collected from saffron exporting companies during 2011–2016. Statistical population of the research included all saffron exporter companies in Khorasan Razavi Province in Iran. There are 42 saffron exporter companies in Khorasan Razavi Province, of which 35 companies are active. Data and information used in the study were obtained from a census of these companies. Given the nature of questionnaire items, some companies were not included in the sample due to lack of adequate information or reluctance and, finally, 14 companies were considered for investigating this research goals. Data collection tools were divided into two categories. Firstly, by using a questionnaire, information about the marketing strategies and other related variables were asked from the managers or foreign export managers of the saffron exporting companies in 2016. Then, using the information and documents available in these companies, the export performance status and other related variables were extracted for 2011-2016.

In order to assess the validity of the content of the questionnaire, the experts' opinion (including university professors and experts in the export and marketing fields) were used. After several stages of revising, the validity of the questionnaire was ensured. Cronbach's alpha coefficient and Spss22 software were also used to measure the reliability of the questionnaire. The Cronbach's alpha coefficient ranges from zero (instability) to one (complete reliability), and the closer the

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number to one, the higher the reliability of the questionnaire. In the current research, the Cronbach's alpha coefficient of the whole questionnaire was 0.84, which was a suitable level, so, the reliability of the questionnaire was acceptable.

Given the local nature of data and according to the fact that saffron exporters are scattered in Khorasan Razavi Province, using the conventional econometric methods are inappropriate and the solution is using spatial panel data regression model. Hence, spatial panel data model was used in order to investigate the role of marketing strategies on the export performance of saffron exporting companies.

Export performance index is a multidimensional index consisting of four sub-indices of profitability in the foreign market (Lages *et al.*, 2005), sales volume in the foreign markets, or the share of a firm in the foreign market to the share of all firms (Salomon and Shaver, 2005), sales growth in the foreign markets (Twarowsha and Kakol, 2013) and export intensity (Agnihotri and Bhattacharya, 2015). Export intensity was measured as the ratio of aggregated export sales to total firm sales. Aggregated export sales are defined as revenue generated by the export of domestically produced goods and/or services provided by domestic offices. Since the four sub-indices of export performance have different scales, in calculating the final export performance index, standardization or normalization of sub-indices was done and then export performance index was obtained by adding the four sub-indices to each other.

There are several methods for normalizing data and Equation (1) is the most appropriate method according to the properties of data:

$$X_n = \frac{X_i - \mu}{\sigma} \quad (1)$$

Where, μ is the mean of X and σ is the standard deviation. Therefore, X_n is the normalized amount of variable X.

Moreover, according to the literature (Ayal and Zif, 1979; Huang and Rozelle, 1998; Mao and Zhang, 2015; Calantone *et al.*, 2003), each marketing strategy was quantified using appropriate indicators. Market penetration strategy was quantified using an index for the number of exported goods and different prices, market development strategy by using the index of export target markets, product development strategy by using the index of new brands and commodity packaging, and differentiation strategy by using the index of organic or healthy product that meets the international standards.

Spatial Panel Regression Model

In the present study, data have a locational part and, therefore, using general methods of econometrics is ineffective because some Gauss–Markov hypotheses are rejected for spatial data due to creating of spatial dependencies (spatial auto-correlation) and spatial heteroscedasticity among observations. According to Gauss–Markov's hypothesis, it is assumed that explanatory variables are constant in repetitive samplings and spatial dependency between samples violates this assumption. Furthermore, spatial heteroscedasticity violates hypotheses of a particular linear relationship between sample observations. When there is the hypothesis of spatial dependency between data, the relation changes by moving among data of spatial sample and coefficients of the linear function will not be according to the dependent variable (LeSage, 2008) and, therefore, spatial econometric approaches should be used. The most comprehensive spatial auto-regression model is a general spatial model (SAC) in which other models are incorporated. The general form of this model is indicated by Equation (2).

$$y = \rho w_1 y + \beta x + \mu \quad (2)$$
$$\mu = \lambda w_2 \mu + \varepsilon$$
$$\varepsilon \approx N(0, \sigma^2 I_n)$$

Where, y is a dependent variable, x is a vector of explanatory variables, and w_1 and w_2 are matrixes of spatial weights whose formation is explained later. These models simultaneously incorporate spatial lag and correlation of error terms. In Equation (2), β

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shows a vector of parameters for explanatory variables, ρ indicates spatial autoregressive coefficient, and λ is the spatial autoregressive coefficient of error terms (Elhorst, 2014).

The first step toward developing a spatial model is creating a neighboring matrix or spatial weights matrix. Two methods for creating this matrix consist of contiguity-based spatial weights matrix, and matrix as a function of distance. Different statistics such as Moran's I and Gary's C statistic can be used to examine and test spatial autocorrelation coefficient and its significance (Bivand, 2009). Moran's I statistic for variable *x* in different regions can be calculated as Equation (3), in which x_i and x_j are values of *x* in different regions and s^2 is the sample variance; w_{ij} is contiguity position of *i* and *j* relative to each other and it is, in fact, the type of their spatial relation that is called weight matrix (Anselin, 2001).

$$I = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} w_{ij}\, c_{ij}}{s^2 \sum_{i=1}^{n}\sum_{j=1}^{n} w_{ij}} = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} w_{ij}\,(x_i-\bar{x})(x_j-\bar{x})}{s^2 \sum_{i=1}^{n}\sum_{j=1}^{n} w_{ij}} \quad (3)$$

In which:

$$s^2 = \frac{\sum_{i=1}^{n}(x_i-\bar{x})^2}{n} \quad (4)$$

The calculation method of Gary's statistic is almost similar to Moran's statistic; however, Moran's statistic emphasizes on deviation from the total average of observations while Gary's emphasizes the difference between two areas relative to each other (Tsai, 2005).

In order to consider the effects of the spatial property in panel data model, the spatial lag of dependent variable, the spatial lag of independent variables, spatial autocorrelation of disturbance or a combination of them can be used. Hausman (1978) test can be used for selecting between fixed and random effects spatial panel regression models. If the mentioned tests confirm the existence of spatial autocorrelation, then the OLS estimates have not reliable results. For this purpose, the LM-error and LM-lag test are used and if neither of these two tests is significant, the OLS method does not give us biased estimates. If only LM-error has significant results, then spatial error regression should be used and if LM-lag has significant results, then spatial lag regression should be applied. Finally, if both LM-error and LM-lag tests are significant, spatial autocorrelation exists and more accurate test such as robust LM- error and robust LM-lag tests should be used and the model must be selected that has significant robust LM.

RESULTS AND DISCUSSION

In Table 2, the descriptive statistics of the independent variables are reported. In addition to marketing strategies, other explanatory variables of company experience, manager's level of education, the number of employees as a proxy of firm's size, marketing costs and R&D costs per month were selected according to the literature.

In the market penetration strategy, the minimum is 1 and the maximum is 5, and it shows at different years how many products from saffron were exported by each firm. The mean of this variable was 3.4, which shows that during 2011-2016 the firms under study in average were exporting 3.4 different saffron products such as saffron flowers, bouquets, bulk, tablet and other items, and with different saffron prices. The average number of countries to which saffron was exported by companies (market development strategy) was 3, with minimum of 1 and maximum of 6. The minimum and maximum number of instruments and mechanisms that were used by the companies (product development strategy) were 2 and 6, respectively, with the average of 3.9, which indicates that in average, companies in the field of saffron used 3.9 different product development tools such as different weights and different qualities. Finally, the minimum and maximum amount of differentiation strategy that complied with international standards such as organic production were,

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Table 2. Descriptive statistics of the explanatory variables.

Variable	Measurement unit	*SD*	Average	Min	Max
Company Experience	Year	11.76	15.85	2	50
Manager's Education	Years of formal education	2.26	14.80	12	18
Number of Employees	Person	24.3	23.6	4	100
Marketing cost per month	Million IRR	80.2	110.3	20	300
R&D costs per month	Million IRR	7.40	7.94	1	30
Market penetration strategy	Number of product export	1.08	3.40	1	5
Market development strategy	Number of export countries	1.48	3	1	6
Product development strategy	Number of the new brand, packaging and etc.	1.24	3.9	1	6
Differentiation strategy	Compliance with international standards	6.9	4.4	3	10

respectively, 3 and 10, with the mean of 4.4, which means that the average of standards used by the firms in the export of saffron was 4.4. Table 3 shows the statistical parameters for the export performance index.

Due to the heterogeneous nature of the data collected from the saffron exporting companies and their distribution in the province, Moran statistic was used for testing the spatial nature of the data. The logic of spatial property in this research is that the state of export performance in each company can affect the export performance of other companies. In Table 4, the results of spatial correlation between error terms are presented.

The results indicate that the spatial correlation between errors terms existed according to all tests and, therefore, for estimating models, spatial panel regression should be used and spatial property of data is confirmed. Other test results are also presented in Table 4. According to the LM SARMA statistic, spatial panel model should replace ordinary panel model.

Considering the significant level of spatial statistics, it seems that estimating the model using a spatial pattern is essential. Otherwise, the results of the model will be biased significantly. Before estimating the regression models, to determine which type of spatial model have better results, the spatial error and lag statistics were obtained. The results of this statistics are presented in Table 5. According to the significance level of LM error (robust), the spatial error model for panel data should be estimated. Table 5 confirms the spatial panel data model in order to investigate the role of marketing strategy on saffron export performance.

The results of estimating spatial fixed effects panel data model are reported in Table 6, which show that variables of company experience, number of employees (as a proxy of company size), marketing cost per month, R&D costs per month, market development strategy, product development strategy, and differentiation strategy have a significant effect on export performance of saffron companies. Company experience in the market has a positive significant effect on the export performance, because companies adopt better strategies in the foreign markets and thus their export performance would be better. Also, Haluk Köksal, (2008) obtained similar results. Furthermore, Cieślik *et al.* (2015) showed that export performance and firm's experience have an inverted S-shaped relationship.

The number of employees in the company as a proxy of firm size has a negative effect on the export performance. Nazar and Saleem (2011) also conclude that if firm size is measured by the number of employees, it has a negative effect on export performance. Smaller firms are quicker and more flexible than the larger ones, because structural simplicity and, therefore, efficient adaptation can provide them a competitive advantage in responding to the requirements of foreign markets (Monteiro, 2013). Marketing cost and R&D costs have a positive significant

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Table 3. Descriptive statistics of export performance index.

Variable	Measurement unit	Average	Min	Max
Net profit from export	Million IRR	323.3	50	960
Sales volume to foreign market	Kg	3257.2	100	14000
Sales growth	Percent	0.1	-2.05	2
Export intensity	Percent	0.5	0.21	0.83

Table 4. Space diagnostic test results.

Test type	Statistics	Prob
Moran I-statistic	-0.08	0.02
LM test	4.61	0.03
LR test	3.64	0.05
Geary GC	1.03	0.04
Getis-Ords GO	0.44	0.00
LM SARMA	11.76	0.05

Table 5. Results of error and lag models.

Type of test	Probability level	Statistic
LM error	0.001	15.55
LM error (Robust)	0.00	18.44
LM lag	0.05	3.71
LM lag (Robust)	0.1	2.61

Table 6. The results of spatial panel regression model.

Variable	Coefficient	Standard deviation	*Z* Statistics	significance level
Company Experience	0.06	0.022	2.64	0.008
Manager's Education	0.15	0.16	0.90	0.30
Number of Employees	-0.06	0.13	-4.65	0.00
Marketing cost per month	0.145	0.066	2.20	0.028
R & D costs per month	0.146	0.14	1.94	0.053
Market penetration strategy	1.52	1.63	0.93	0.24
Market development strategy	0.77	0.26	2.91	0.004
Product development strategy	1.88	0.87	2.16	0.033
Differentiation strategy	0.18	0.05	3.32	0.001
Rho	0.71	0.33	2.11	0.02
Sigma	1.19	0.41	2.85	0.009

Log likelihood= -62.99; *F*-Test = 7.1423; *P*-Value> F (9, 75)= 0.092; R^2 0.46; LR test= 7.49, *P*-Value> Chi^2 (1)= 0.06.

effect on the export performance, because with increasing competition in the international markets, companies should devote sufficient financial resources to marketing and R&D costs, which in turn could improve the export performance. Neves *et al.* (2016) also emphasized that engaging in R&D and marketing activities will increase the firm's probability of engaging in export activities.

Although market penetration strategy is not statistically significant, but it has a positive impact on the export performance of saffron exporter companies. That is, the more is the number of saffron items such as saffron flowers, bouquets, bulk, tablet and other items, and with different saffron prices, the

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more export performance would increase. Although this coefficient is not statistically significant, its co-directionality with the dependent variable implies its impact on the company's export status. Leonidou *et al*. (2002) also showed that although some marketing strategy variables demonstrate positive effects on overall export performance, the relationship is not always significant. The next variable is market development strategy or the number of export target countries. The coefficient of this variable is positive and significant. That is, with an increase in the number of export target countries for the saffron product, export performance is also significantly increased. As mentioned before, export sales and volume are implicitly considered in export performance index and increase in the target countries would increase export sales and volume and ultimately would increase export performance. Cieślik *et al.* (2015) also showed that the relationship between the growth of the number of export countries and export performance is initially positive.

Product development strategy for saffron in the forms of supplying product in different qualities, more extensive distribution of the product in the markets, and creating new brands, has a positive and significant effect on export performance. Considering the coefficient of this variable compared to other strategies, the results show that this strategy can be considered as a major strategy for increasing companies' export performance.

The last factor that affects export performance is the adaptation of differentiation strategy. In this strategy, the company's activities are focused on preparation and production of unique product or service. By considering the global standards in the production of saffron such as healthy and organic products, the export performance would increase considerably. Positive and significant spatial dependence coefficient indicates that contiguity has an important role in the companies' export performance. That is, if export performance index of other companies was increased by one unit, export performance of the respective company is increased by 0.71 units. On the other hand, it can be stated that export performance of the companies not only depends on the marketing strategies but also the export performance of neighboring companies influence the export performance of the respective company. F test, R-squared statistics, and LR test all indicate the goodness of fit in the model. Furthermore, according to Brush-Pagan and Jarque-Bera statistics, the homoscedasticity and normality properties of residuals were confirmed.

In Table 7, the results of spatial fixed effect panel data models for different indexes of the export performance index are compared. According to the results of Table 7, marketing strategies affect differently on each criterion of export performance. For instance, while market penetration and market development strategy affect sales growth, market development strategy and differentiation strategy affect export intensity. By applying market penetration or market development strategy, sales would increase in the foreign markets and thus sale's volume index would increase. Because in the market penetration strategy the market size is constant, saffron exporters are trying to gain more market share or at least maintain their previous shares in the market. Therefore, they try to achieve this goal by promotion or other suitable marketing mixes that lead to increase in their sales volume. Market development strategy requires the expansion of the potential market through new customers and new users for saffron, which leads to sales and export growth. On the other hand, the use of market development strategy and product differentiation can increase the export intensity by increasing the amount of export of saffron. Naturally, when production in the country is between 350 and 400 tons per year, market development and product differentiation can bring more of this production to foreign markets and increase the export intensity index.

In Table 8, the results of two models of fixed effects panel and spatial panel are compared. The results show that coefficient of determination of spatial error model with

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Table 7. The effects of explanatory variables on each index of export performance.

Dependent var Independent var	The overall export performance index	Firm's profitability	Sale's volume	Sale's growth	Export intensity
Manager's experience	0.06 (0.22)*	3.44 (1.61)	0.05 (0.04)	-0.004 (0.01)	0.01 (0.01)
Manager's education	0.15 (0.16)	4.81 (8.6)	0.14 (0.19)	0.03 (0.03)	0.22 (0.09)
Number of Employees	-0.06 (0.13)	-1.96 (0.92)	0.05 (0.02)	0.007 (0.005)	-0.02 (0.01)
Marketing cost	0.145 (0.066)	10.9 (4.68)	-0.15 (0.1)	0.06 (0.02)	0.06 (0.05)
R&D cost	0.146 (0.14)	17.45 (5.6)	0.09 (0.1)	0.03 (0.02)	0.1 (0.06)
Market penetration strategy	1.52 (1.63)	17.9 (13.1)	-0.08 (0.3)	0.2 (0.1)	0.03 (0.16)
Market development strategy	0.77 (0.26)	11.02 (13.9)	0.32 (0.3)	0.16 (0.07)	0.33 (0.15)
Product development strategy	1.88 (0.87)	6.64 (15.7)	0.17 (0.35)	0.15 (0.07)	0.08 (0.17)
Differentiation strategy	0.18 (0.05)	2.74 (4.45)	0.01 (0.11)	0.02 (0.03)	0.15 (0.05)
Log likelihood	-62.9	-517.8	-117.4	-96.8	-142.5
R^2	0.46	0.77	0.13	0.11	0.22

* Standard deviations are in the parentheses.

fixed effects is more than fixed effect panel data model. Also, greater likelihood ratio statistics show the excellence of spatial panel compared to the simple panel data model.

CONCLUSIONS

In this study, the role of marketing strategies on the export performance of 14 saffron exporting companies was investigated using spatial panel data regression model in 2011-2016. Export performance index was constructed using four sub-indices of profitability in the foreign market, sales volume in the foreign market, sales growth in the foreign market, and export intensity. Furthermore, marketing strategies of market penetration, market development, product development, and product differentiation were constructed using appropriate indices and their effects on the export performance index were investigated using spatial panel data approach. According to the results of the spatial panel data regression model, variables of company experience, the number of employees (or firm size), marketing cost, R&D costs, market development strategy, product development strategy, and differentiation strategy have a significant effect on the export performance of saffron companies. According to the result that product development strategy has a higher effect on the export performance index, it is recommended that saffron exporting companies develop and improve their export

Table 8. The results of two models of fixed-effects panel and spatial panel.

Model	Log likelihood	R^2
Panel with fixed effects	-69.3	0.34
Spatial panel with fixed effects	-62.9	0.46

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performance by applying this strategy due to market conditions. More attention to the different quality levels of saffron, developing new features and applications of saffron by R&D activities, creating powerful brands of saffron in the global arena, and improving technology for production and export of saffron are some recommendations in this regard. Due to the positive and significant effect of market development strategy on export performance of saffron companies, new markets and partners for exporting saffron is another strategy that could enhance the export performance of saffron companies. Expanding the potential market through new users or new uses of saffron by appropriate marketing and R&D costs could increase the export performance of firms. Moreover, creating value and brand loyalty for Iranian saffron could be used as tactics of product differentiation strategy that, in turn, could improve the export performance of saffron companies. Moving toward producing healthy and organic products that match the international standards can play an important role in this regard. Furthermore, the results of spatial panel data model show that R&D and marketing costs have a positive significant effect on the export performance, therefore, appropriate use of these tools could also enhance export performance. The results of this research can be used by policymakers, managers of export companies, and researchers in a variety of ways. According to the research results, proper use of various marketing strategies can improve the export performance of saffron. As a result, policymakers should focus on developing marketing consulting services for agricultural exporters, in collaboration with related organizations like the Ministry of Foreign Affairs, the Ministry of Agriculture Jihad, and the Ministry of Economy. Establishing an export holding company and marketing consulting firm in partnership with the private sector becomes possible in this regard. Corporate managers can also exploit the results of this research because they can see the impact of using different marketing strategies on different indicators of export performance, and by using appropriate marketing strategies they can reach their goals in expanding export capabilities. As the results of Table 7 show, each marketing strategy can affect a particular aspect of export performance; hence, corporate executives can choose the appropriate marketing strategy according to their goals.

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نقش استراتژی های بازاریابی بر عملکرد صادرات محصولات کشاورزی: مطالعه موردی زعفران در ایران

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چکیده

روند صادرات در برخی کشورهای در حال توسعه از جمله ایران حاکی از آن است که علاوه بر عوامل برونزا مثل نوسانات نرخ ارز و سیاست های دولت، یک سری متغیرهای درونزا نیز روی میزان و ارزش صادرات محصولات اثر گذار است. در بین این عوامل درونزا، نقش استراتژی های بازاریابی دارای اهمیت زیادی است. در مطالعه حاضر، نقش استراتژی های بازاریابی بر عملکرد صادرات شرکت های صادر کننده زعفران در استان خراسان رضوی در ایران با استفاده از مدل رگرسیون پانل فضایی مورد بررسی قرار گرفته است. به منظور محاسبه شاخص عملکرد صادرات، چهار عنصر سودآوری، حجم فروش، رشد فروش و شدت صادرات مورد استفاده قرار گرفته است. داده ها و اطلاعات تحقیق از شرکت های صادرکننده زعفران طی دوره ۲۰۱۶-۲۰۱۱ با روش سرشماری گردآوری شده است. نتایج نشان داد که

استراتژی های بازاریابی تمایز، توسعه بازار و توسعه محصول دارای اثرات مثبت معناداری روی عملکرد صادرات زعفران در ایران بوده اند. از این رو با بکارگیری استراتژی های مناسب بازاریابی در بازار های مختلف، می توان عملکرد صادرات را افزایش داد.

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