



Structural Modeling of the Effect of Dimensions of International Entrepreneurial Marketing on the Tendency Towards It (Case: Greenhouse Owners in Tehran Province)

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Article Info	ABSTRACT
Article type: Research Article	International entrepreneurial marketing has emerged as a novel strategy in global and national trade. Considering the global challenges associated with traditional agricultural production, foresight in sustainable agricultural development through greenhouse cultivation and the international entrepreneurial marketing of these products is of critical importance. The main objective of this study is to identify and explain the components of international entrepreneurial marketing in greenhouse. This study was applied in terms of its objective and descriptive survey in nature. The This research is a quantitative survey that is applied in terms of its purpose and nature. The statistical population consists of vegetable and summer crop greenhouse operators in Tehran Province. A stratified random sampling method with proportional allocation was employed, covering four counties: Pakdasht, Pishva, Varamin, and Shahr-e Ray. From a total of 1934 greenhouse units, a sample size of 322 was determined based on Krejcie and Morgan's table. Data were analyzed using Partial Least Squares Structural Equation Modeling with SmartPLS 3 software. According findings entrepreneurial capability exerted the strongest impact on growers' tendency ($\beta=0.364$, $t=8.065$). Furthermore, the model's results revealed that approximately 44% of the variance ($R^2=0.44$) in the latent variable of international entrepreneurial marketing tendency is explained by the direct effects of these three capabilities. Results highlight the necessity of a paradigm shift from a production-oriented approach to an "international marketing-oriented" strategy for greenhouse products. To overcome environmental challenges, the three aforementioned capabilities alone are insufficient. These capabilities must be integrated within the framework of a new meta-capability, namely strategic adaptability in international marketing. This would enable producers to rapidly sense market demands and align their operations with the socio-cultural requirements of global markets.
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Introduction

Competition in international trade has become increasingly complex and challenging across all economic sectors. This competition exists across all sectors including industry, service, and agriculture. However, the agricultural industry in developing countries plays a more significant role compared to the industrial and service sectors (Shafipour Motlagh et al., 2022). Unfortunately, evidence indicates that global agricultural production is declining and failing to meet growing food demand. One of the main reasons for this decline is the neglect of product marketing, which weakens farmers' motivation to continue their activities (Anabestani & Tolabi Nejad, 2019). Under such circumstances, cross-border activities, particularly exports, are considered a vital tool for firms. These activities provide opportunities such as value creation, fostering growth, and access to new knowledge and technologies in international markets (Yeoh, 2004). Internationalization enables small and medium-sized enterprises to strengthen the capabilities necessary for competing and succeeding in global arenas. This issue is very important for greenhouse owners, who possess fewer resources and less experience for competing in global markets (Sanoubar et al., 2018). International entrepreneurship is defined as the process of discovery, enactment, evaluation, and exploitation of opportunities at the international level to create future goods and services (Rahmani et al., 2020). Hence, to achieve a worthy standing in global competition, the development of entrepreneurship must be incorporated as a key axis in the macro-policy-making of the agricultural sector (Rasekhi et al., 2018).

On the other hand, given the multiplicity of global markets, selecting the appropriate target market or markets and directing product marketing activities towards them is one of the primary concerns of producers active in the international arena (Foruzandeh et al., 2020). Agricultural product marketing, as a key method, is a factor that accelerates the development and progress of farmers and increases their income (Anabestani & Tolabi Nejad, 2019). Moreover, entrepreneurial activity, as a central concept in strategy formulation, is essential for improving performance and achieving success (Rezaei et al., 2017).

Among various agricultural activities, greenhouse cultivation is widely used to provide a controlled environment that enables optimal production and significantly enhances product quality (Kouchaky et al., 2025). The total area of greenhouse units in the country amounts to 17,134 hectares. Of this amount, 12,777.7 hectares are dedicated to greenhouse vegetables and summer crops, 3,273.7 hectares to flowers and ornamental plants, 151.9 hectares to medicinal plants, and 526.9 hectares to greenhouse strawberries. The expansion of greenhouse cultivation is significant not only for increasing production but also for preserving small-scale agricultural land use. Tehran Province, as one of the provinces with the highest density of greenhouses, has had an increasing share in this sector. In 2020, Tehran Province accounted for approximately 21 percent of the total greenhouse area in the country, ranking first among all provinces (Statistical Center of Iran, 2021). Considering this position, the importance of marketing greenhouse products in Tehran Province plays a significant role in sustainable economic development. This development is realized through the growth of the employment chain, sustainable economy, market development, and the export of the country's agricultural products.

Theoretical Framework

Entrepreneurial marketing lies at the intersection of marketing and entrepreneurship. This concept has drawn the attention of researchers since the 1980s (Lorestani et al., 2020). Its objective is the proactive utilization of opportunities through innovative perspectives. Entrepreneurial marketing is considered an effective substitute for the flourishing of conventional marketing activities. Organizations with an entrepreneurial marketing orientation possess a better capacity to respond to the changing environment compared to competitors lacking this orientation. They also exhibit higher

competitive capability, resource leveraging, and distinctive opportunity-seeking behavior (Rezvani et al., 2011). Entrepreneurial marketing is defined as the proactive identification and exploitation of opportunities for acquiring and retaining profitable customers through innovative approaches to risk management, resource leveraging, and value creation (Jones et al., 2023). This concept is founded on seven fundamental dimensions, including opportunity focus, innovativeness, and value creation. By relying on creative tactics and risk management, firms can overcome their resource limitations (Sadiku-Dushi et al., 2019).

The operational dimensions or behavioral indicators of the international entrepreneurial marketing concept have been examined separately in various studies. These indicators synergistically provide a comprehensive picture of the extent of economic actors' engagement in entrepreneurial marketing activities in the international arena. Some existing theories, such as International Learning and Adaptation Theory (ILAT) and Dynamic Capabilities Theory (DCT), are also closely related to International Entrepreneurial Behavior (IEC). The ILAT is one of the powerful theoretical frameworks for explaining the success of firms in complex international business environments, particularly from an entrepreneurial perspective. This theory focuses on the idea of how firms acquire knowledge from external environments, absorb it, and then adapt themselves for better performance within these environments. A firm's ability to succeed in these environments is heavily dependent on its capacity for learning and adaptability (Zollo & Singh, 2004). According to DCT, dynamic capabilities equip international entrepreneurs with the tools to not only enter global markets but also sustain growth in competitive environments. The sensing capability assists the international entrepreneur in identifying new opportunities and emerging threats in global markets. The seizing capability allows him to exploit these opportunities swiftly and effectively in unfamiliar environments. The transforming capability is also essential for aligning the business with changing international conditions (Teece et al., 1997; Teece, 2007).

Based on the review of the theoretical literature, the existing theoretical model posits that the tendency towards international entrepreneurial marketing behavior, as a multidimensional construct, manifests through a set of marketing strategies and capabilities at the firm level. Within this framework, product branding and standardization, product export, and electronic marketing are recognized as the primary and complementary dimensions of this tendency. These dimensions play a significant role in facilitating the internationalization process and creating competitive advantage.

a) Product Branding and Standardization: This dimension reflects innovation, differentiation, and the product's acceptability in global markets. International branding creates unique challenges and opportunities compared to domestic markets. The main goal is to establish a strong and consistent brand identity across borders while paying attention to cultural and market differences (Keller, 2009).

b) Product Export: This dimension is a direct indicator of entry into foreign markets. Hill (2017) examines exports and argues that exporting is often the first step for many firms on the path to internationalization.

c) Electronic Marketing: This dimension represents the utilization of modern tools for global reach and engagement with international customers. Electronic marketing enables firms to reach international customers through modern tools such as social networks (Yang, 2018), allowing entrepreneurs to gain a competitive advantage by delivering superior value and creating new market needs. In this regard, leveraging information technology, especially social networks, provides a platform for entrepreneurs to create a tangible competitive advantage through delivering superior value to customers in processes such as creating new needs and rendering old products obsolete.

In the meantime, the greenhouse product value chain, as a key enabling factor, can significantly contribute to strengthening entrepreneurship. Integrating value-creating activities within this chain, especially in a knowledge-based economy, not only facilitates the supply process but also leads to price competitiveness in global markets (Agwu, 2018; Ansari Ranani & Ghasemi Namaghi, 2009). Ultimately, at the international level, the concept of international entrepreneurial marketing as a

strategic model is based on three fundamental components: (1) the entrepreneurial capability of the system to identify cross-border opportunities, (2) the marketing capability to create competitive value, and (3) international skills for navigating complex global environments (Weerawardena, 2003). The combination of these three pillars provides the necessary foundation for moving beyond domestic markets.

Literature Review

International marketing and international entrepreneurship have largely been addressed separately in the literature. Few studies have paid attention to both components in an integrated manner. In the research by Zahra et al. (2024) and Clark et al. (2026), the concern has been raised that international business research on new and young ventures overlooks important entrepreneurial characteristics. According to these authors, the essence of entrepreneurship is often marginalized. Two key aspects require attention: the entrepreneurial behavior of the firm and its level of commitment to foreign markets. In line with these foundations, Gil-Pechuan et al. (2013) state that success in foreign markets depends not solely on internal strengths but requires creativity, ingenuity, and calculated risk-taking. Accordingly, innovativeness (the ability to create and introduce new products), along with risk-taking and proactive behaviors, constitute the core framework of international entrepreneurship. Zhang et al. (2017) examined the impact of entrepreneurial capability on the export performance of SMEs in China and South Korea. They found that government support, regulations, and transparency significantly affect firms' export performance. Agwu & Onwuegbuzie (2018) investigated the effects of international marketing environments on entrepreneurship development. The results showed that political systems and government regulations governing trade exchanges have a direct relationship with the success of entrepreneurs in international arenas. Based on this, they proposed a government-supportive framework as a necessary platform for entrepreneurs to achieve success in international markets. Vadana et al. (2020) examined the digitalization of firms in international entrepreneurship and marketing. The results showed that the digitalization of the value chain and the increased use of web and mobile software infrastructures by firms can lead to a higher share of foreign sales with their relatively limited assets. Berndt et al. (2023) emphasize transnational market management, such that the professional collection and processing of target market information is the foundation for adopting market orientation capability to achieve operational objectives.

Domestic researchers have also examined the entrepreneurial approach in international marketing (Shafipour Motlagh et al., 2022; Rahmani et al., 2020). According to the studies by Rastegar & Shabani (2016) and Foruzandeh et al. (2020), in explaining the international entrepreneurial marketing model and the mediating role of entrepreneurship on performance, the four factors of communication capability, environmental capability, innovation orientation capability, and market orientation capability are the variables present in the international entrepreneurial marketing model; and export entrepreneurship has a positive dependence on internal factors such as management's export commitment and resources related to experience and structure, and on environmental contingency factors such as the intensity of competition and the difference between firms' export markets, which positively affect export performance. Shafipour Motlagh et al. (2022) identified political factors at both domestic and international levels as the most important determinant for developing Iran's agriculture with an entrepreneurial approach. Individual characteristics of farmers rank second in importance. Alipour Moghadam et al. (2025) demonstrated that to strengthen market knowledge competence in the field of agricultural product exports, emphasis must be placed on the necessity of investing in the development of international marketing networks, the establishment of market data analysis systems, and the cultivation of human capital.

Conceptual Framework

A review of the theoretical foundations and research background shows that several studies have focused on the role of innovation, opportunity identification, flexibility, and market orientation in improving the performance of small and agricultural businesses. Nevertheless, the results of these studies indicate that these factors have often been examined in a fragmented manner without being placed within a coherent conceptual framework. In this context, entrepreneurial marketing and its extension to the international arena play a vital role. The relatively nascent concept of international entrepreneurial marketing is essential for ensuring export success of agricultural product producers, particularly in the greenhouse sector. This necessitates a gradual liberation from heavy dependence on the domestic market and traditional intermediary networks. In this way, direct and sustainable access to regional and global markets becomes feasible. Consequently, the transition from a production-oriented paradigm to an international marketing orientation is a fundamental necessity for sustainable development and competitiveness in the greenhouse industry. Given the serious gap in research concerning greenhouse production, this study has examined international entrepreneurial marketing in the production of greenhouse products. Therefore, the fundamental research gap is the absence of a comprehensive international entrepreneurial marketing model for greenhouse products.

The present study seeks to identify the most important components of international entrepreneurial marketing in the production of greenhouse products in Tehran Province and to find answers to the following questions:

1. What is the level of tendency towards international entrepreneurial marketing among greenhouse owners?
2. What is the effect of each international marketing component on the operators' tendency towards international entrepreneurial marketing?
3. What strategies can be proposed for developing the international entrepreneurial marketing environment?

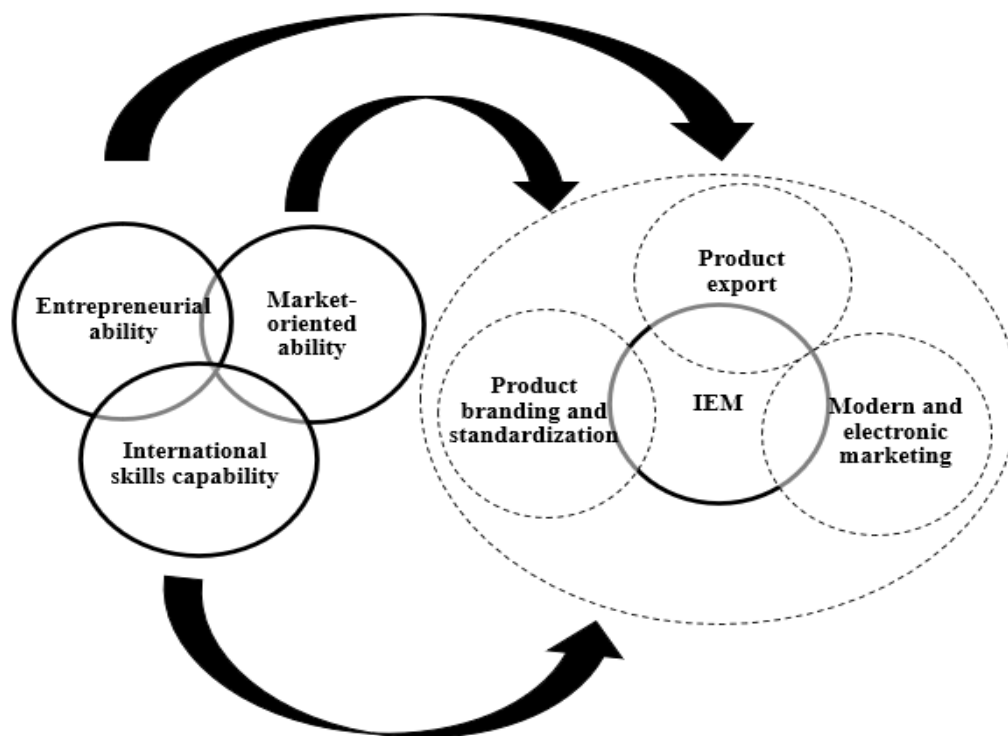


Figure 1. Conceptual research model

Materials and Methods

This applied study employed a descriptive-correlational approach and covariance matrix analysis. The statistical population consisted of 1,934 active greenhouse vegetable units in the counties of Pakdasht, Pishva, Varamin, and Shahr-e Rey. Using stratified random sampling with proportional allocation and following Krejcie and Morgan's (1970) sample size determination table, 322 greenhouse owners were selected. The data collection instrument was a researcher-made questionnaire, whose validity and reliability were confirmed. Data analysis was performed using SPSS_{v.26} and SmartPLS_{v.3} softwares. Structural equation modeling based on partial least squares was employed. This variance-based approach emphasizes prediction in complex models with causal structures and is widely used in the social sciences (Sarstedt et al., 2022; Magno et al., 2024).

The evaluation of the measurement model was conducted by assessing convergent validity, discriminant validity (Fornell-Larcker matrix), and composite reliability. Composite reliability is used to examine the internal consistency among manifest variables. Values between 0.6 and 0.7 for composite reliability are acceptable. The Average Variance Extracted (AVE) index exceeds 0.5, confirming discriminant validity. The evaluation of discriminant validity was performed using the Fornell-Larcker matrix in SmartPLS software. The Fornell-Larcker matrix requires that the square root of the AVE for each latent construct (on the diagonal) exceeds its correlations with other constructs (off-diagonal). If the square root of the AVE value for latent variables (on the main diagonal of the matrix) is greater than their correlation values with other constructs (in the cells below), the measurement instrument possesses adequate discriminant validity (Fornell & Larcker, 1981). After confirming the measurement model, the evaluation of the structural model was conducted using the coefficient of determination (R^2), the Blindfolding index (Q^2), the collinearity index, and the examination of relationships between variables and their significance.

The R^2 criterion indicates the effect of the exogenous variable on the endogenous variable. The benchmark values for weak, moderate, and strong R^2 are 0.19, 0.33, and 0.67, respectively. The Q^2 index determines the predictive power of the model for the endogenous variables. If the relationships between the constructs in the model are correctly defined, the constructs will influence each other, and the hypotheses will be properly confirmed. Positive Q^2 values indicate good model fit and appropriate predictive power (Henseler et al., 2009; Hulland, 1999). The collinearity index is calculated based on the VIF. VIF values lower than 5 indicate the absence of collinearity among the variables and that the variables possess the necessary precision. Significance was also assessed using the t-statistic. Values greater than 2.58 were considered significant at the 0.01 error level. Both the measurement and structural models demonstrated good fit. Additionally, the conceptual model of the research possessed appropriate predictive power (Sarstedt et al., 2022).

The main variables of the international entrepreneurial marketing model, broken down by the dimensions and items of each section, are presented in Table 1. In general, this research includes two groups of variables: observed variables (including the dimensions of international entrepreneurial marketing and the tendency towards international entrepreneurial marketing) and latent variables. All variables were measured using a Likert scale.

Results and discussion

Structural and Production Characteristics of the Greenhouse

The mean total area of the studied greenhouses was 6,757.19 square meters. The average production of greenhouse crops was 115.107 tons. In terms of infrastructural and production characteristics, the highest frequency belonged to 156 greenhouses (48.4%) with an age of 6 to 10 years. The mean age of the greenhouses was 8.6 years. The minimum age was one year and the maximum age was 25 years. The majority of greenhouses (92.5%) were modern. 2.2% of greenhouses were traditional, and 16 greenhouses (5%) had a combination of traditional and modern structures.

Table 1. Latent and observed variables of the marketing model

Dimensions	Latent variable	Number of items	Researchers/year	Observed variables
Dimensions of International Entrepreneurial Marketing	Entrepreneurial ability	10	Khakzadian & Rezaei (2021) ; Foruzandeh et al. (2020) ; Rahmani et al. (2020) ; Ji et al. (2019) ; Yang (2018) ; Maatoufi (2018) ; Rahimnia & Hassani Rad (2016) .	Idea generation, creativity, innovation, problem-solving ability, commitment and responsibility, entrepreneurial motivations and attitude, entrepreneurial knowledge and awareness, entrepreneurial culture, being a pioneer before competitors (initiative and proactive)
	Market-oriented ability	4	Khakzadian & Rezaei (2021) ; Zarei & Hemmati (2021) ; Foruzandeh et al. (2020) ; Sadiku-Dushi et al. (2019) ; Schwens et al. (2018) ; Yang (2018) ; Rahimnia & Hassani Rad (2016) ; Maatoufi (2018) ; Walker (2011) .	Customer orientation, creating value for the customer, leveraging resources, opportunism
	International skills capability	6	Khakzadian & Rezaei (2021) ; Foruzandeh et al. (2020) ; Maatoufi, (2018) ; Rahimnia & Hassani Rad (2016) ; Zhang (2017) ; Navarro-Garcia et al. (2015) .	Networking and communications, identifying and monitoring regional and international markets, trying to learn international marketing, international experiences, paying attention to global market policies, paying attention to government policies and the country's legal structure.
Orientation towards international entrepreneurial marketing	Modern and electronic marketing	10	Shafipour Motlagh et al. (2022) ; Khakzadian & Rezaei (2021) ; Foruzandeh et al. (2020) ; Shirikhodaei et al. (2012) .	Research and development for new markets; tendency to invest in regional countries; tendency to change the method of production management, planning and sales; tendency to accept new ideas and new marketing methods; tendency to modify the production system towards new markets and new customers; tendency to enter the domestic and international stock market; tendency to participate in local and international electronic exhibitions; tendency to web-based electronic marketing and sales; tendency to internet advertising and social networks for sales; tendency to set up computer and online systems for selling products.
	Product export	5	Shafipour Motlagh et al. (2022) ; Khakzadian & Rezaei (2021) ; Foruzandeh et al. (2020) ; Shirikhodaei et al. (2012) .	Tendency to cultivate specific export products or products with competitive advantage; Tendency to invest in advertising to sell export products; Tendency to sell wholesale and directly to product exporters (indirect exports); Tendency to sell products directly and without intermediaries in the global market (direct exports); Tendency to sell products to geographically neighboring countries.
	Product branding and standardization	5	Shafipour Motlagh et al. (2022) ; Khakzadian & Rezaei (2021) ; Foruzandeh et al. (2020) ; Shirikhodaei et al. (2012) .	Tendency to obtain healthy product standards; Tendency to purchase healthy and authorized inputs; Tendency to ensure consumer health and satisfaction; Tendency to comply with the permitted limits for the use of toxins and inputs; Tendency to produce healthy and quality products.

Regarding ownership, 233 greenhouses (69.3%) were privately owned, 3.9% were rented, and 0.6% were joint ownership. Additionally, 8.16% of greenhouse owners used a combination of private, rental, and joint ownership arrangements. Most greenhouses (92.9%) used drip irrigation system, 5%

used traditional irrigation, and 1.8% used a combination of several irrigation methods. Due to limited water resources, about 79.8% of greenhouses used multiple water sources including wells and ponds. In terms of crop type, the highest frequency belonged to tomato cultivation (144 greenhouses out of 322 greenhouses), followed by cucumber (33.2%), bell pepper (19.3%), and eggplant (2.2%).

Components of International Entrepreneurial Marketing

The research conducted to determine the priority of the components of international entrepreneurial marketing in the greenhouse production system indicates that the importance of these components is, in order: entrepreneurial capability (ranked first), market orientation capability (ranked second), and international skills capability (ranked last).

In the entrepreneurial capability section, which was placed in the first rank of importance from the perspective of the operators, problem-solving ability was recognized as the most important factor. In contrast, risk-taking ranks as the least important. This prioritization signifies that in the turbulent and high-risk environment of greenhouse cultivation and the presence of intermediaries, the internal readiness of the firm to cope with uncertainties and disruptions in the supply and distribution system is of more critical value than accepting merely new risks. These findings are consistent with those of Ponomarov & Holcomb (2009).

Customer orientation ranks as the highest priority within market orientation capability. This finding reflects the view of Walker (2011), who considers customer orientation the main pillar of marketing. Moreover, the necessity of a value-creation approach for profitable customers in this section emphasizes the use of innovative approaches. This is in line with the study by Jones et al. (2023). In contrast, the resource leveraging ranks last in this section, reflecting difficulties in accessing financial resources and facilities.

In the international skills capability, international experiences (including presence in exhibitions or contact with exporters) was considered more important than mere networking and communication. This finding is aligned with the study by Abubakari et al. (2022), which emphasizes the importance of acquiring operational foreign market knowledge and previous experiences for facilitating the speed of internationalization.

Table 2. The most important and least important sub-components of international entrepreneurial marketing

Main component	The most important subcomponent	Mean	The least important subcomponent	Mean	Rank
Entrepreneurial ability Market-oriented ability	Problem-solving ability	2.58	Risk-taking	2.50	1
	Customer orientation	2.44	Leveraging resources (access to financial resources and facilities)	1.94	2
International skills capability	International experiences (exhibitions, visits, exporter contacts)	2.15	Networking and communications (membership in domestic and international social networks)	1.57	3

Source: Research findings.

Greenhouse Owners' Tendency Towards International Entrepreneurial Marketing

The results of Table 3 show that the studied greenhouse owners have a relatively high to high tendency towards modern and electronic marketing at about 45 percent, towards product export at about 47 percent, and towards product branding and standardization at about 45 percent. Overall, the level of the studied greenhouse operators' tendency towards international entrepreneurial marketing stands at 49.1 percent. This is assessed at a relatively high to high level.

Prioritization of international entrepreneurial marketing components

The prioritization analysis of the items of international entrepreneurial marketing in the production system identifies three main axes. In modern marketing management, setting up online sales systems (mean 3.26) holds the highest priority. This item emphasizes the use of digital tools for direct sales.

In contrast, participation in local and international electronic exhibitions is the least important option. In the area of product export, the greatest focus is on selling products to neighboring countries (mean 2.46). Following this, cultivating specific export crops or products with competitive advantage and direct export are placed in the subsequent priorities. In the branding and standardization section, observing the permissible limit for pesticide and input use (mean 2.52) has been placed as the highest priority as the most important factor for ensuring product health and meeting export requirements. In general, the operators' strategy is focused on three axes: online sales, regional targeting, and ensuring product health. The results of this research emphasize the simultaneous importance of internal entrepreneurial readiness, focus on customer needs, and adherence to product health standards as the main drivers of international entrepreneurial marketing in this sector.

Table 3. Frequency distribution of greenhouse owners' tendency towards international entrepreneurial marketing components

	High		Relatively High		Relatively Low		Low		Mean	Std	Min	Max
	%	N	%	N	%	N	%	N				
Modern and electronic marketing	20.2	65	24.8	80	37.6	121	17.4	56	3.05	0.51	1.90	4.40
Product export	17.4	56	29.5	95	32.9	106	20.2	65	2.28	0.93	1	4
Product branding and standardization	17.7	57	27.6	89	38.5	124	16.1	52	2.03	0.52	1	3.40
Total	21.1	68	28.0	90	33.2	107	17.7	57	2.45	0.48	1.50	3.73

Source: Research findings.

Table 4. Prioritization of the observed variables of international entrepreneurial marketing

Variable	Items	Mean	SD	Rank
Modern and electronic marketing	Research and development for new market	3.04	1.20	7
	Tendency to invest in regional countries	3.07	1.08	6
	Tendency to change in production management, planning and sales methods	3.22	1.01	2
	Tendency to accept new ideas and new marketing methods	3.15	1.08	4
	Tendency to modify the production system towards new markets and new customers	2.96	1.03	8
	Tendency to enter the domestic and international stock market	3.11	0.90	5
	Tendency to participate in local and international electronic exhibitions	2.64	1.14	10
	Tendency towards web-based e-marketing and sales	3.19	1.06	3
	Tendency towards online advertising and social networks for sales	2.87	1.05	9
	Tendency to set up computer and online product sales systems	3.26	0.92	1
Product export	Tendency to cultivate specific export crops or products with competitive advantage	2.34	1.41	2
	Tendency to invest in advertising to sell exported products	2.18	0.96	4
	Tendency towards wholesale and direct sales to product exporters (indirect exports)	2.18	1.10	5
	Tendency to sell products directly and without intermediaries in the global market (direct export)	2.23	0.97	3
	Tendency to sell products to geographically neighboring countries	2.46	1.23	1
Product branding and standardization	Tendency to obtain healthy product standards	1.86	0.80	4
	Tendency to purchase healthy and authorized inputs	1.90	0.72	3
	Tendency to ensure health and consumer satisfaction	1.79	0.73	5
	Tendency to comply with the permissible limits for the use of pesticides and inputs	2.52	1.68	1
	Tendency to produce healthy and quality products	2.11	1.05	2

Source: Research findings.

Evaluation of the measurement models

The measurement models were evaluated using confirmatory factor analysis to assess validity and reliability. Reliability was assessed through factor loadings, t-values, composite reliability, and Cronbach's alpha, and validity was evaluated through convergent and discriminant validity indices.

According to the research results (Table 5 and Figure 2), the factor loading values of the model variables are higher than 0.6. This indicates that the manifest variables are acceptable indicators of

their respective latent constructs. Additionally, t-values greater than 2.58 were obtained. That indicates the appropriate fit of the model, significance, and reliability of the variables. Cronbach's alpha and composite reliability (CR) values exceed 0.7 for all constructs. Therefore, the studied model possesses strong reliability.

To assess convergent validity, the Average Variance Extracted (AVE) criterion was used. According to Table 5, the AVE value was obtained above 0.7. The optimal value of this index is equal to or greater than 0.5. Therefore, the model variables possess adequate convergent validity. To improve the AVE and model fit, some manifest variables were removed.

To assess the discriminant validity of the model, the Fornell and Larcker matrix was used. According to Table 6 and based on the values on the diagonal of the matrix, it can be concluded that the model possesses good discriminant validity.

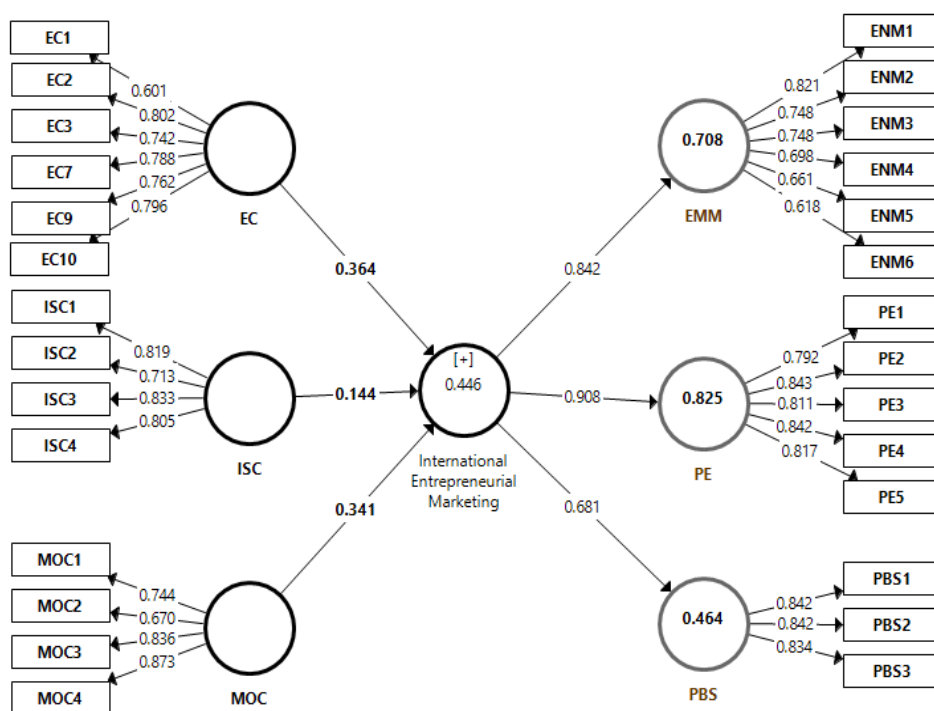


Figure 2. Factor loadings and path coefficients of the international entrepreneurial marketing model

After confirming the goodness of fit of the measurement model, the evaluation of the structural model is conducted. To evaluate the structural model and the endogenous latent variables, the criteria of the coefficient of determination (R^2), the Q^2 index, the collinearity index (VIF), and the significance of path coefficients were used.

The R^2 indicates the explanatory power of the model for the endogenous variables. This coefficient ranges between zero and one. Higher values indicate greater predictive power of the model. According to Table 7, the structural model of the research has one endogenous variable called the tendency towards international entrepreneurial marketing. The R^2 value for this variable was obtained as 0.446. This value indicates an acceptable model fit and its appropriate explanatory power. In other words, approximately 44 percent of the variance in greenhouse owners' tendency towards international entrepreneurial marketing is explained by the variables of entrepreneurial capability, market orientation capability, and international skills capability through direct paths. The Q^2 index for the endogenous variable of tendency towards international entrepreneurial marketing was obtained as 0.17. This positive value indicates adequate predictive power. Furthermore, the collinearity index, based on VIF values, showed that all values are less than 5. Consequently, there is

no collinearity problem in the model. All path coefficients have t-values greater than 2.58. Therefore, they are statistically significant. Based on this, the structural model of the research has an appropriate fit, and the interpretation of the results is possible.

Table 5. Goodness of fit assessment statistics for the reflective part of the measurement model

Concept	Symbol	Factor loading	T	CR	AVE	Cronbach's alpha
Entrepreneurial ability	EC1	0.601	8.065	0.885	0.565	0.844
	EC2	0.802				
	EC3	0.742				
	EC7	0.788				
	EC9	0.762				
	EC10	0.796				
Market-oriented ability	MOC1	0.744	7.336	0.864	0.824	0.791
	MOC2	0.670				
	MOC3	0.836				
	MOC4	0.873				
International skills capability	ISC1	0.819	3.004	0.872	0.630	0.807
	ISC2	0.713				
	ISC3	0.833				
	ISC4	0.805				
Modern and electronic marketing	ENM1	0.821	39.715	0.864	0.517	0.811
	ENM2	0.742				
	ENM3	0.748				
	ENM4	0.698				
	ENM5	0.661				
	ENM6	0.618				
Product export	PE1	0.792	68.930	0.912	0.674	0.879
	PE2	0.843				
	PE3	0.811				
	PE4	0.842				
	PE5	0.817				
Product branding and standardization	PBS1	0.842	19.716	0.877	0.704	0.790
	PBS2	0.842				
	PBS3	0.834				

Source: Research findings.

Table 6. Fornell-Larcker Research Model

	Entrepreneurial ability	Modern and electronic marketing	International skills capability	Market-oriented ability	Product branding and standardization	Product export
Entrepreneurial ability	0.751					
Modern and electronic marketing	0.422	0.719				
International skills capability	0.276	0.316	0.794			
Market-oriented ability	0.416	0.404	0.444	0.908		
Product branding and standardization	0.441	0.367	0.386	0.681	0.839	
Product export	0.489	0.631	0.313	0.557	0.503	0.821

Source: Research findings.

Results of the model analysis

The factors influencing the international entrepreneurial marketing of greenhouse owners are affected by the variables of entrepreneurial capability, market orientation capability, and international

skills capability, with the effect of each direct path being significant at the 1 percent error level and at a 99 percent confidence level with a t-value criterion higher than 2.54. According to the results (Figure 2 and Table 7), which show the direct effects and relationships between the variables, the validity of the hypothesis testing can be confirmed. Therefore, based on the results of the hypothesis tests, entrepreneurial capability, with an impact coefficient of 0.364, and market orientation capability, with an impact coefficient of 0.341, demonstrated the highest level of influence on the tendency towards international entrepreneurial marketing, and international skills capability, with a coefficient of 0.144, was placed in the subsequent rank. The acceptance of these hypotheses at a 99 percent confidence level highlights the fundamental importance of these capabilities in developing greenhouse exports in Tehran Province (which, with a 21 percent share, ranks first in the country in this industry).

Table 7. Direct effects of factors influencing greenhouse farmers' tendency towards international entrepreneurial marketing

Path	β	T-Value	Result
Entrepreneurial capability -> International entrepreneurial marketing orientation	0.364	8.065	Confirm
Market-oriented capability -> tendency towards international entrepreneurial marketing	0.341	7.336	Confirm
International skills capability -> International entrepreneurial marketing orientation	0.144	3.004	Confirm

Source: Research findings

Discussion

This research was conducted with the aim of explaining the model of International Entrepreneurial Marketing (IEM) in greenhouse product production units in Tehran Province. The research findings confirm the prominent and significant role of three main capabilities (entrepreneurial capability, market orientation capability, and international skills capability) in greenhouse owners' tendency towards IEM approaches. These three capabilities, which were considered as the main variables of the model, all have a positive and significant effect on the tendency towards international entrepreneurial marketing.

Based on the research results, entrepreneurial capability has a positive and significant effect on greenhouse owners' tendency towards international entrepreneurial marketing. The t-value for this parameter is higher than 2.58, with a 99 percent confidence level. This result confirms that success in foreign markets is not merely a function of financial resources, but is rooted in innovative behaviors, risk-taking, ideation, and creativity. To overcome traditional export barriers, greenhouse owners need ingenuity and creativity in identifying overlooked opportunities. These findings are in line with the views of Khakzadian & Rezaei (2021) and Ji et al. (2019). Risk-taking does not mean recklessness, but, consistent with the view of Gil-Pechuan et al. (2013), it means the ability to capture profitable transactions through creativity, ingenuity, and risk calculation in highly volatile international environments. Therefore, the entrepreneurial capability of individuals or small and medium-sized enterprises is considered one of the most important and influential fundamental factors in international entrepreneurial marketing. It is suggested that officials and policymakers, by strengthening the culture of innovation, creativity, and risk-taking, provide opportunities for the simultaneous growth of farmers. These opportunities include strengthening their commitment and sense of responsibility, empowerment through presenting new market-related ideas, and promoting greenhouse businesses such as e-business and the sale of green and organic products. Consistent with Kouchaky et al. (2024), greenhouse owners' habituation to traditional cultivation methods can be an obstacle to the export and marketing of green greenhouse products. Training farmers with the help of the agricultural extension and education institution plays a significant role in increasing awareness and knowledge of applying modern methods (such as green technologies) in producing healthy products and branding. The entrepreneurial empowerment of greenhouse owners through training, promoting innovation, strengthening intelligent risk-taking, and leveraging modern technologies plays a key role in developing international entrepreneurial marketing and increasing the export of

greenhouse products. This approach provides a sustainable path for the simultaneous growth of farmers, enhancing competitiveness, and achieving a successful presence in global markets.

Another finding of the research indicates the positive and significant effect (0.341) of market orientation capability (intelligent value chain management) on the international success of greenhouse owners. This finding is consistent with the research of Foruzandeh *et al.* (2020) and Sadiku-Dushi *et al.* (2019) and demonstrates that in a knowledge-based economy, value creation for the customer takes precedence over production. According to the analysis by Berndt *et al.* (2023), operating in transnational markets is not feasible without the professional processing of target market information. In fact, the greenhouse owner must be able to use the strategy of resource leveraging to compensate for their financial limitations. For this capability to become operational, the establishment of specialized export cooperatives and healthy product branding is essential. These measures directly strengthen the value chain and optimize the final price in global competition. Therefore, export cooperatives for greenhouse product production, specific insurance and tax support for producers in international marketing, subsidies and facilities for the production of healthy and exportable products, and government support through guaranteed purchase of green and healthy brand products are recommended for improving market orientation tendency. In summary, intelligent value chain management and market orientation play a key role in the international success of greenhouse owners. The combination of supportive policies, the development of export cooperatives and branding, the enhancement of the market information system, and the support for the production of healthy products paves the way for the transition from traditional production orientation to sustainable international market orientation for the greenhouse sector.

In examining international skills capability (which can be called a communication bridge to global markets), the results confirmed the positive effect of this capability with a coefficient of 0.144. This finding is consistent with the results of Navarro-García *et al.* (2015). Foreign market knowledge is not a tangible and fixed asset; rather, it is a skill acquired through gaining experience in the foreign environment and direct presence. As Abubakari *et al.* (2022) point out, the speed of internationalization of small and medium-sized enterprises is directly dependent on their knowledge of foreign markets. Presence at international exhibitions and benchmarking against leading exporters is the only way to learn environmental complexities. International skills training, presence at exhibitions or visiting foreign markets, and benchmarking against exemplary international entrepreneurs are among the factors influencing the acquisition of international skills capability. It is suggested that the government enhance the international intelligence of operators by facilitating exhibition visits and business travel. Foreign market intelligence and knowledge is a strategic asset for greenhouse owners. Enhancing it is a combination of skills training, practical experience, and benchmarking against successful international models. Implementing these strategies, in addition to increasing the chances of success in international markets, contributes to the sustainable development of greenhouse businesses and the creation of a sustainable competitive advantage.

According to the results of prioritizing marketing items, three main strategies can be presented for operators:

Setting up online sales systems (mean 3.26) holds the highest priority in modern marketing management. This emphasis, consistent with the studies of Shafipour Motlagh *et al.* (2022), indicates the necessity of using digital tools, freeing oneself from intermediation, and moving towards the digitalization of sales. This approach is considered a requirement for growth in global markets. In product export, the focus is on selling products to neighboring countries (mean 2.46). This approach, in line with the research of Foruzandeh *et al.* (2020), emphasizes regional targeting and the selection of appropriate target markets. In branding and standardization, the most important factor was determined to be observing the permissible limit for pesticide and input use (mean 2.52) to ensure product health and meet export requirements. This priority, consistent with the study by Ansari Ranani & Ghasemi Namaghi (2009), confirms the necessity of paying attention to the value chain

and product quality. Product quality is the key to success in a knowledge-based economy. These findings indicate that the combination of sales digitalization, regional market targeting, and adherence to product quality standards paves the way for the success of greenhouse owners in international markets. Implementing these strategies, while increasing marketing efficiency, also ensures sustainable competitive advantage and the trust of foreign customers.

Conclusion

his research contributes to the international entrepreneurial marketing literature by presenting a comprehensive and innovative model. The proposed model emphasizes strategic adaptability as an overarching capability alongside the recognized capabilities. By focusing on the greenhouse industry in Tehran Province, this research has identified the gap between potential and performance. It also provides practical solutions for the transition from production orientation to sustainable international marketing orientation. This helps policymakers, industry practitioners, and researchers to gain a more comprehensive understanding of how to succeed in global markets.

Theoretical implications

The development of the international entrepreneurial marketing model in the greenhouse sector of Tehran Province revealed that about 51 percent of the studied greenhouse owners have a low tendency towards international entrepreneurial marketing. This situation, despite the vital importance of the agricultural industry in the country's economy (consistent with the study by Shafipour Motlagh et al., 2022), indicates a serious gap in converting potential capabilities into sustainable export performance. The results also confirmed the direct and positive effect of entrepreneurial, market orientation, and international skills capabilities as the main drivers of greenhouse owners' tendency towards exports. However, the ever-increasing competition in the international trade arena and the exposure of greenhouse businesses to high uncertainties have turned the paradigm shift from production orientation to international marketing orientation into a fundamental necessity.

To overcome the challenges arising from environmental pressures and market dynamism, merely possessing the three capabilities (entrepreneurial, market orientation, and international skills) is not sufficient. These capabilities must be synergized and deployed within the framework of a comprehensive and meta-foundational capability called strategic adaptability in international marketing. Strategic adaptability, which is a relatively emerging concept, is considered an overarching capability encompassing foreign market sensing, flexibility, speed, and responsiveness. This capability enables firms and farmers to sense market needs, adapt to the demands of international markets, and respond to threats in dynamic markets.

Furthermore, a better understanding of the impact of socio-cultural parameters of global markets through this capability contributes to a successful presence in global markets. The development of this adaptability requires gradual learning, innovation, and strategic partnerships. In this regard, the active participation of stakeholders, including governmental institutions, the private sector, non-governmental organizations (NGOs), and local entrepreneurs, is essential for translating national climate change policies into effective actions at the community level. (Razzaghi Borkhani et al., 2026)

Practical implications

Based on the findings of this research, understanding the current situation and the necessity of changing the paradigm from production orientation to sustainable international marketing orientation is a fundamental requirement for the greenhouse industry of Tehran Province. The low tendency of about 51 percent of greenhouse owners towards international entrepreneurial marketing indicates the need for supportive and developmental measures to fully exploit existing capabilities. Possessing

entrepreneurial, market orientation, and international skills capabilities alone is not sufficient. Synergizing these capabilities through the capacity of strategic adaptability is essential for confronting dynamic and competitive markets. This understanding can serve as a guide for action for policymakers and industry practitioners.

Suggested paths for future research

In order to increase the level of greenhouse owners' tendency from the current situation and to develop the IEM environment, the following solutions are proposed. These solutions can also serve as a basis for future research:

- **Strengthening Entrepreneurial Capability:** Focusing on problem-solving and innovation through reinforcing the culture of innovation and creativity and presenting new plans and ideas. Facilitating the promotion of electronic businesses and the sale of green and organic products through setting up online sales systems (instead of solely focusing on electronic exhibitions). Future research can focus on effective implementation models and measuring innovation.
- **Enhancing Market Orientation Capability and Quality Assurance:** Forming greenhouse product export cooperatives for transnational market management and reducing intermediation. Providing insurance, tax, and subsidy support for the production of healthy and exportable products that comply with the standard of observing the permissible limit for pesticide and input use. Government support through guaranteed purchase of green and healthy brand products to strengthen producers' motivation in focusing on customer orientation and export quality. Future research can examine the effectiveness of new support models and export quality indicators.
- **Developing International Skills Capability and Adaptability:** Focusing on training international skills and facilitating targeted presence at exhibitions or visiting foreign markets. These measures transform experiences into organized knowledge and enable benchmarking against exemplary international entrepreneurs. Providing conditions for strategic networking (beyond mere membership in social networks) accelerates the internationalization process. Future research can focus on developing effective educational frameworks and models for measuring the level of strategic adaptability in organizations.

These targeted measures will help greenhouse producers in Tehran Province, while overcoming internal infrastructural problems, to achieve the strategic adaptability necessary for sensing, adapting to, and swiftly responding to opportunities and threats in regional and global markets. In this way, they can increase their share in sustainable economic development.

Author Contributions

The first author conceived and designed the study based on the approved research project and was primarily responsible for data collection, conducting interviews with respondents, data analysis, interpretation of the findings, drawing the conclusions, and preparing the original draft of the manuscript. The second author critically reviewed and revised the manuscript and also contributed to the literature review and the development of the study's theoretical framework. The third author was responsible for English language editing and linguistic refinement of the manuscript and also contributed to data collection and the preparation of the research documentation. All authors read and approved the final version of the manuscript.

Data Availability Statement

The data used in this study are available from the corresponding author upon reasonable request

Ethical considerations

The authors conducted this research in accordance with accepted ethical standards in scientific publishing. They avoided data fabrication, data falsification, plagiarism, and any form of research misconduct.

Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this manuscript. The authors declare no conflict of interest regarding the publication of this article.

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اطلاعات مقاله	چکیده
نوع مقاله: مقاله پژوهشی تاریخ دریافت: ۱۴۰۴/۱۰/۲۲ تاریخ بازنگری: ۱۴۰۵/۰۲/۰۳ تاریخ پذیرش: ۱۴۰۵/۰۲/۱۱ تاریخ انتشار: تابستان ۱۴۰۵ کلیدواژه‌ها: توسعه پایدار کشاورزی، کارآفرینی بین المللی، زنجیره ارزش، صادرات.	بازاریابی کارآفرینانه بین المللی به عنوان یک راهبرد نوین تجارت در جهان و کشور مطرح است. با توجه به چالش جهانی تولید محصولات کشاورزی به روش سنتی، آینده نگری در توسعه پایدار کشاورزی با توسعه کشت گلخانه‌ای و بازاریابی کارآفرینانه این محصولات در سطح بین المللی حایز اهمیت است. هدف کلی این تحقیق تبیین مؤلفه‌های بازاریابی کارآفرینانه بین المللی در تولید محصولات گلخانه‌ای استان تهران است. این تحقیق با توجه به ماهیت و نوع پژوهش از نوع تحقیق پیمایشی با روش کمی و از لحاظ هدف کاربردی است. جامعه آماری تحقیق را بهره‌برداران گلخانه‌های سبزی و صیفی جات استان تهران تشکیل می‌دهند که با روش نمونه‌گیری تصادفی طبقه‌ای با انتساب متناسب چهار شهرستان پاکدشت، پیشوا، ورامین و شهر ری با مجموع ۱۹۳۴ واحد گلخانه انتخاب شدند. مطابق با جدول مورگان حجم نمونه در این پژوهش ۳۲۲ واحد تعیین گردید. برای تحلیل داده‌ها از مدل سازی معادلات ساختاری مبتنی بر حداقل مربعات جزئی با نرم افزار Smart PLS3 استفاده شد. یافته‌ها بیانگر آن است که عوامل تأثیرگذار بر گرایش بازاریابی کارآفرینانه بین المللی گلخانه‌داران تحت تأثیر مؤلفه‌های قابلیت کارآفرینانه، قابلیت بازاریابی و قابلیت مهارت بین المللی است که این تأثیرگذاری در سطح اطمینان ۹۹٪ مورد تأیید واقع شد و بر اساس ضریب مسیر (PC) بیشترین تأثیر را در درجه اول قابلیت کارآفرینانه (با ضریب مسیر ۰/۳۶۴ و t-value ۸/۰۶۵) بر گرایش گلخانه‌داران داشته است. حدود ۴۴ درصد از تغییرات متغیر وابسته گرایش به بازاریابی کارآفرینانه بین المللی با اثر مستقیم قابلیت کارآفرینانه، قابلیت بازاریابی و قابلیت مهارت بین المللی تبیین شده‌است. نتایج نهایی بر ضرورت تغییر پارادایم از "تولیدمحوری" به "بازاریابی محوری بین المللی" در محصولات گلخانه‌ای تأکید دارد. برای غلبه بر چالش‌های محیطی، صرف داشتن قابلیت‌های سه‌گانه کافی نبوده و لازم است این توانمندی‌ها در چارچوب یک فراقابلیت نوین یعنی تطبیق پذیری استراتژیک در بازاریابی بین المللی سازماندهی شوند تا تولیدکنندگان به سرعت بتوانند نیازهای بازار را حس کرده و با نیازهای اجتماعی-فرهنگی بازارهای جهانی سازگار شوند.

استناد: خراسانی، محمد؛ رزاقی بورخانی، فاطمه و عزیزی خالخیلی، طاهر (۱۴۰۵). مدل سازی بازاریابی کارآفرینانه بین المللی در تولید محصولات گلخانه‌ای استان تهران. *مجله تحقیقات اقتصاد و توسعه کشاورزی ایران*، ۲-۵۷، (۲)، ۳۵۱-۳۶۸. DOI: <https://doi.org/10.22059/ijaedr.2026.409574.669414>

