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Studying the Effect of Worker Productivity and the Intensity of Research and Development on the Export Behaviors of Small and Medium Export Companies in Khorasan Razavi Province

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Abstract: In this study, an attempt has been made to study the effect of workers' productivity and the intensity of research and development on the export behaviors of small and medium-sized export companies in Khorasan Razavi province. The present study is a measurement research in the method research and at the purpose of the goal is, the research to usage and development study. The statistical population of this research is the managers of small and medium export companies in Khorasan Razavi province. The sampling method was based on simple random sampling. A questionnaire was used to collect the required information. A questionnaire was used to collect the required information. This research is based on structural equations and for data analysis, partial least squares method and Smart PLS software have been used. The results showed that workers' productivity had a significant effect on export behaviors and the intensity of research and development of small and medium export companies in Khorasan Razavi province also, the effect of research intensity on the development of small and medium export companies in Khorasan Razavi province has been positive.

Keywords: Worker productivity, Research and development intensity, Export behaviors, Small and Medium export companies.

INTRODUCTION

Organizations are a set of human, technological, technical, structural, cultural and other environmental elements that interact in order to achieve a set of predetermined and common goals (Agion and Howitt, 2017). Undoubtedly, given that these goals and interests of individuals are not necessarily consistent, the way managers deal with balancing, reducing conflict and making optimal use of the potential abilities of individuals and elements is important (Dograva, 2011). In this regard, the employees of any organization are the most important part of the organization, which is inevitable regardless of their wishes and needs. The set of scientific achievements shows that from the simplest accessories to the most advanced complex technologies, it is the product of creativity and innovation of thinkers that has been created for many years based on human knowledge and intellectual development (Nazari, 2012). Therefore, the main source of wealth of any country is human resources which is referred to as the main factor and natural and material resources are called as subordinate factors. Under these circumstances, the role of human resources has improved and expanded not only at the organizational level but also in general from the level of a small economic unit to the national level. On the other hand, not paying attention to this concept will cause hidden losses for any organization, in addition to obvious losses such as loss of resources, profit, opportunity, increase of operating costs, hiring, and etc. ,the most important of which is the loss of organizational credibility and prestige in the eyes of competitors and customers. Therefore, the importance of paying attention to this category in any organization is of great importance (Mohammadzadeh et al., 2012).

The economic growth of any country can be achieved under the influence of two factors: One is the accumulation of factors of production, including physical capital and manpower and another is to increase the level of efficiency and productivity of production factors. Productivity has a positive effect on almost all economic issues, both micro and macro, both in the short and long term. Finally, it causes the growth, prosperity and dynamism of the country's economy (Mini, 2011). According to endogenous economic growth theories, total factor productivity is a function of the accumulation of research and development capital. Because internal research and development activities lead to the production of tradable goods and services and more efficient use of available resources and the absorption of advanced foreign technology. This factor not only leads to the creation of technology for the production of new goods, but also creates new ways of using production components or emerging raw materials.

In Iran, the position of productivity in the country's development plans and the vision document has been considered as required in the Fourth Development Plan (2005-2009).

The productivity share of different economic sectors will increase from the projected growth of 8% to 2.5%. Also in the Fifth Development Plan (2014-2015) in order to increase the share of productivity in economic growth to one-third was required at the end the National Productivity Organization of Iran should be established as a government institution affiliated to the deputy using the existing facilities to develop and approve the comprehensive productivity program of the country. Among different economic sectors, small and medium enterprises have a special place as the driving force of the country's economic development¸ at the micro level, the productivity of an economic enterprise is the main axis of competition for it. Therefore, identifying the effective factors and determining their effect on the productivity growth of all sectors, especially the industrial sector, which is the most influential sector in the country's economic growth¸ It seems necessary to adopt strategic policies in the export sector (Mehregan, 2016).

On the other hand, export-oriented policies can be implemented by institutions that are not necessarily involved in export promotion in order for exports to behave, it is necessary to use an appropriate combination of monetary and exchange rate fiscal policies (Song et al., 2017) when policies are implemented, they are often aimed at goals other than productivity and R&D in the export market therefore, it is necessary to make a good connection between export strategies in order to achieve more export goals for this purpose, the implementation of various policies requires the establishment of coordination between units within the organization (Qalandari, 2017). Export behaviors are directly related to the economic structure and how changes in the development process and is able to increase the added value of export goods through the process of marketing and import substitution, and by promoting export to promote growth, reduce the instability of export earnings¸ therefore, it can be said that structural behavior is a process of economic transformation that is done by transferring resources within a sector to higher value-added activities or outside a sector to other sectors and in this way leads to the development of inter-sectoral relations (Parang and Wardir, 2017).

In this regard, Zhao et al. (2017) show that export behavior is mainly focused on developing performance and reducing export barriers However, increasing research has been conducted that confirms the use of other market orientations, including institutional barriers, geographical scope, and investment uncertainty. These researchers claim that companies can maximize productivity by developing export behavior based on reducing these barriers that are appropriate to their environment and organizational characteristics (Azizi, 2018). In addition, export behavior is a strategic market behavior that allows for the introduction of new ideas and seeks such ideas themselves. Export companies that have more capacity for export behavior are more successful in responding to the competitive environment and developing new capabilities and this leads to a competitive advantage and superior export productivity for them (Zhao et al., 2017).

Statistics in small and medium-sized export companies indicate that they have not paid much attention to export processes and capabilities based on performance improvement (Qalandari,2017)¸ Therefore, in the meantime, the topics of market orientation, optimal marketing strategies and attention to the approach of export behavior have also been neglected and uninterested¸ in addition, part of this neglect can be attributed to the fact that in the past, there has been little understanding of the relationship between export behavior, therefore, due to increasing changes in the export market environment in recent years and increasing customer dissatisfaction, export managers to maintain survival and have better productivity than their competitors they need to achieve better productivity by rectifying the business environment based on competitiveness, research intensity and development, and the structure of market strategies.

In this regard, small and medium enterprises are among the important industries and the increasing development of human knowledge has caused this industry to benefit greatly from this knowledge. Today, small and medium enterprises are one of the engineers of economic growth in many countries. However, scholarly studies show that export behavior enhances productivity and competitiveness through export research and development processes. However, small and medium-sized companies are subject to many changes and according to the existing conditions for survival and profitability, they should make efforts to eliminate barriers and shortcomings and follow the new methods of the export market based on export behavior and adopt new and constructive methods. What is the purpose of this study in response to this effect of worker productivity and the intensity of research and development on export behaviors of small and medium export companies in Khorasan Razavi province?

RESEARCH STUDIES

Models based on research and development, at a constant level of capital and labor, suggest technological advancement as one of the reasons for increased production. Therefore, productivity growth is determined within the model rather than assumed to be constant that one of the determining factors is investment in research and development (Shahabadi, 2010). Research and development can lead to economic growth in two ways. First, innovation and the introduction of new products have a greater and better role in production than existing capital goods. Second, research and development activities have side effects on the inventory of science and knowledge, which in turn reduces research and development costs. In general, these models assume that labor,

capital, and technology are combined to improve technology and by allocating more resources to research and development, it leads to increased innovation and, consequently, productivity. The cost factor of research and development and technological progress reduces costs, increases productivity and growth of exports (Zaranjad 2015).

The main feature of capital-based models is the existence of non-descending returns on capital. In this model, the production function is 2- as y = f (k) in which y represents the amount of production and k represents the volume of capital. According to Nelson and Phelps (1966), economic growth stems from the stock of human capital, which affects the ability of countries to innovate and develop. In general, human resources play an important role in expanding and deepening the productive activities of workshops, the optimal and efficient use of physical capital, as well as the promotion of research and development activities. Of course, all of the above depends on the characteristics of the workforce, including education, skills, experience and many other factors. Which makes the role and its effect different at different times (Mastromako et al., 2012). According to the theory of human capital, just as physical capital increases the economic productivity of human beings¸ in the same way, human capital from education enhances the productivity of individuals. Labor training can modify it and prepare it for adaptation to new processes and techniques and allow productivity to grow rapidly. The foundation of increasing productivity in organizations requires emphasizing on human resources in terms of quality and preventing people from being out of time in their profession. Also, the more employees with higher education in industry and, of course, in a suitable job position, the more they can use physical capital more efficiently and thereby increase productivity. Also, the high level of education provides the possibility of more efficient activities in the research and development sectors, which is an important source of productivity growth (Mohammadzadeh et al., 2012). In this way, educated and skilled manpower can be effective in expanding and deepening domestic R&D activities and attracting foreign research and development faster. Another factor affecting productivity growth that is examined in this study is the skill factor. Skill is a component that is acquired over the years and, apart from the level of education of individuals, depends on their ability to do things. Considering the definition of productivity as "doing the right things right", we realize the importance of experience and skill in promoting the category of productivity. On the other hand, as mentioned in the education section, skills help in the proper use of physical capital as well as the creation, expansion and absorption of internal and external R&D. Among the components related to manpower, we can mention the effect of wage and salary employees on productivity. Paid employees are employees who receive a certain salary for the work they do for the workshop and unpaid employees include active owners and partners, and unpaid family workers include those who run the workshop or they are partners in its administration and do not receive regular wages and salaries for their work. In this way, it is possible to measure whether productivity increases in exchange for an increase in foreign employees and wages (Artega, 2016).

Zhao et al. (2017) suggest that export behaviors have a greater effect on the productivity and competitive advantage of firms. They invest better in assets that leverage innovation in a dynamic business environment. Takata (2016) conducted a study among 36 Japanese companies using a case study approach. They developed a framework of export behaviors that could be used as a qualitative tool to measure the art of marketing in small manufacturing companies. By applying the high export capability framework to Japanese companies, it has been revealed that the type of export behavior has played an important role in competitive advantage (Takata, 2016). Neoclassical economic theories argue that unreasonable interest rates have not been rational for any organization or company considering the best conditions for the market and the organization. Unless the organization can achieve a competitive advantage over other competitors with creative and innovative ideas based on export behavior and work harder in attracting customers (Martin et al., 2019).

Based on the proposed frameworks, the following hypotheses are proposed:

1. Worker productivity has a positive effect on export behavior.
2. The intensity of research and development has a positive effect on export behavior.
3. Workers' productivity has a positive effect on the intensity of research and development.
4. Worker productivity has a positive effect on export behavior through the intensity of research and development.

Based on the explanations and review of studies and research principles, the conceptual model of research in order to better and easier understanding of the relationships between variables will be in the form of Figure.) 1(
In this research, the effect of workers' productivity and the intensity of research and development on the export behaviors of small and medium export companies in Khorasan Razavi province have been studied.

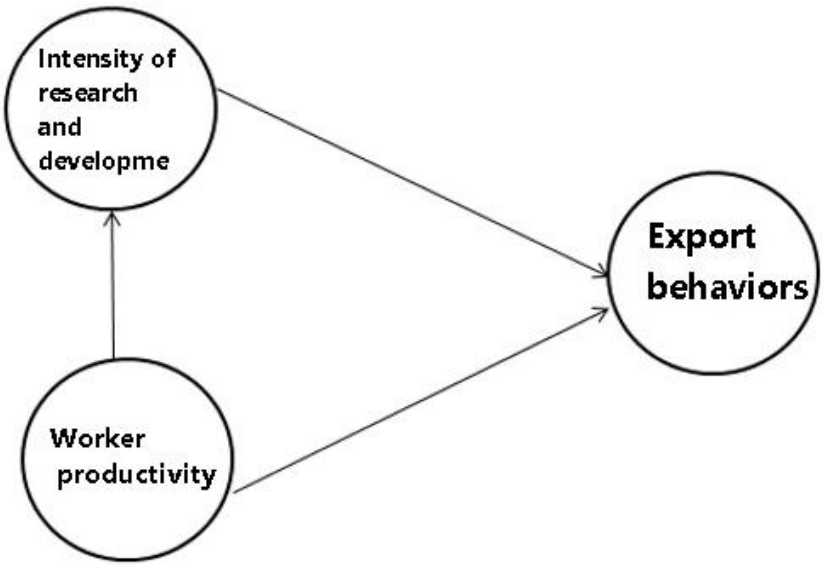

Fig.1: Research Conceptual Model: (Martin et al, 2019)

METHODOLOGY

The present study is applied in terms of purpose and in terms of descriptive method, it is a survey. The statistical population is the managers of small and medium export companies in Khorasan Razavi province. Since the number of members of the statistical population of the study was more than 350¸ considering the maximum variance and 5% error level, 120 people were identified and more than 100 questionnaires were distributed electronically to increase the return rate of the questionnaire and facilitate research which of these, 82 managers completed the questionnaire and this number was the basis for analysis and testing of hypotheses. To collect research data, a questionnaire containing 21 questions was designed by examining the standard questionnaire and related articles in the field of research variables which measured the research variables using a five-choice Likert scale (1 = very low to 5 very high). To measure the effect of customers 'immediate purchase on customers' immediate purchase, a questionnaire consisting of 21 closed-ended questions with a 5-point Likert scale was used which the range is from very agree to very disagree.

In this research, partial least squares (PLS) method has been used to analyze the data. First, this method does not rely on assumptions such as the normal distribution of observed reagents and the large sample size. Second, this method is used for the purpose of predicting and exploring possible relationships. In other words, unlike methods based on covariance that try to adapt the data to the theoretical model of research, this method seeks to discover the theory that lies in the data (Fazli and Houshangi, 2014).

FINDINGS

The findings of this study are divided into two general categories. The first category of findings is related to the validity and reliability of structures and references and model fit¸ for this purpose, the measurement model test including validity test (internal consistency) and validity (divergent validity) has been used. To evaluate the validity of the structures, three criteria proposed by Fresnel and Larker were used, which include: 1) Composite validity 2) Mean variance extracted and 3) Validity of each item. Dillon-Goldstein coefficient (ρc) and Cronbach's alpha were used to evaluate the combined validity of each structure. Dillon Goldstein and Cronbach's alpha coefficients for all structures are more than 0.857 and 0.754, respectively, which is more than the required minimum value of 0.7. Also, the average value of variance extracted for all structures is more than 0.558, which is more than the required minimum value of 0.5. Table (1) shows the composite validity values, Cronbach's alpha, and the mean variance extracted for each structure.

Table 1: Results of validation of variables

Variable	Combination coefficient	Cronbach's alpha	Mean variance extracted
Worker productivity	0.859787	0.754635	0.672102
Intensity of research and development	0.883174	0.838281	0.562566
Export behavior	0.887280	0.840744	0.612627

The factor load of the items is also shown in Table (2) (highlighted numbers). In the partial least squares method for the reliability of the reagents, the factor load for each reagent should be greater than 0.6 (Houshangi et al., 2017). The majority of variables have a factor load higher than the minimum value of 0.6 and only two of the reagents (EMC1, ER5) have a factor load of less than 0.6 according to Baidu rule and the average variance of the extracted structures (which is higher than 0.5), these reagents can also be preserved (Houshangi et al., 2016).

Table 2: Factor loads and transverse loads of research references

Item	Worker productivity	Intensity of research and development	Export behavior
1	0.879960	0.454791	0.621708
2	0.787530	0.400453	0.561601
3	0.788526	0.470693	0.420893
4	0.363739	0.567080	0.321054
5	0.413868	0.623578	0.487811
6	0.402488	0.848935	0.472733
7	0.443870	0.815878	0.530959
8	0.442128	0.785620	0.443850
9	0.339096	0.813278	0.427212
10	0.591923	0.455576	0.821473
11	0.518624	0.548496	0.844755
12	0.569608	0.390295	0.736190
13	0.351971	0.437870	0.704200
14	0.509666	0.535442	0.798017
15	0.514318	0.327099	0.501706
16	0.580369	0.443102	0.543331
17	0.528441	0.406049	0.537091
18	0.335864	0.295450	0.372471
19	0.128398	0.088158	0.256830
20	0.365250	0.311972	0.504075
21	0.429233	0.247581	0.430396

Transverse load test is used to check the validity of the reagents ¸in which the factor load of each reagent for its own structure should be more than the factor load of that reagent for other structures (Qani et al., 2013). The test results of this test are shown in Table 2. The results indicate the appropriate validity of the references¸ because all reagents have a higher factor load for their structure than their factor load for structures. For example, the factor load of reagent 1 is equal to 0.879, which is greater than the values of 0.454, 0.621, 0.508, 0.423. To evaluate the validity of the structures, Chen recommends that the mean root of the extracted variance of the structures should be greater than its correlation with other structures. Which indicates that the correlation of the structure with its markers is more than its correlation with other structures (Amin Afshar and Fazli, 2018). Table (3) presents the validity results of the structures.

Table 3: Correlation matrix and mean root of variance extracted from the original model

Variable	Worker productivity	Intensity of research and development	Export behavior
Worker productivity	1		
Intensity of research and development	0.539175	1	
Export behavior	0.654925	0.607220	1

In modeling structural equations using the partial least squares method, an index called goodness of fit (GOF) is used to check the fit of the model. This index considers both measurement and structural models and is used as a measure of the overall performance of the model. The range of this index is between zero and one and Wetzels et al. (2009) introduced three values of 0.01, 0.25 and 0.36 as weak, medium and strong values for GOF, respectively. As can be seen in Table 4, the GOF value is 0.666, which indicates that the overall model fit is strongly confirmed.

Table 4: Goodness of fit Model

Variable	Common coefficient	The coefficient of determination	GOF
Worker productivity	0.672102	-	
Intensity of research and development	0.562566	0.6753	
Export behavior	0.612627	0.7703	**0/666**
Medium	**0/609**	**0/391**	

The second category of findings of this research is dedicated to testing the structural model and research hypotheses that for this purpose, the path coefficient and the determination coefficient obtained by the partial least squares algorithm with Smart PLS software. The path coefficient shows the share of each of the predictor variables in explaining the variance of the criterion variable (Fazli and Aminafshar, 2016). To calculate the value of T statistic, bootstrap algorithm with 100 subsamples was used. Figure 2 shows the T-statistic for path coefficients and Figure 3 the final research model is estimating path coefficients.

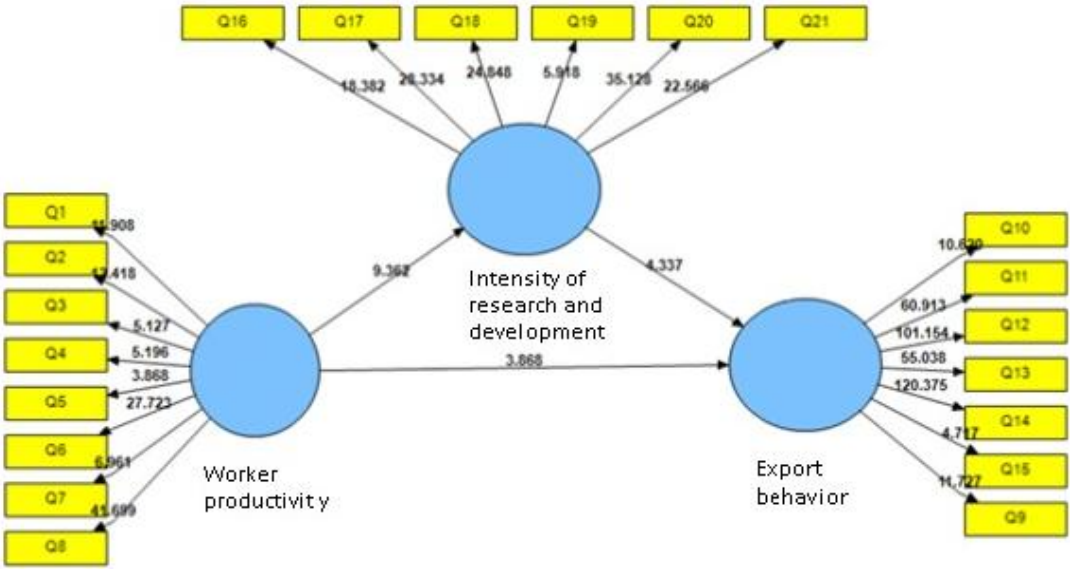

Fig.2: Structural model of research in a meaningful state

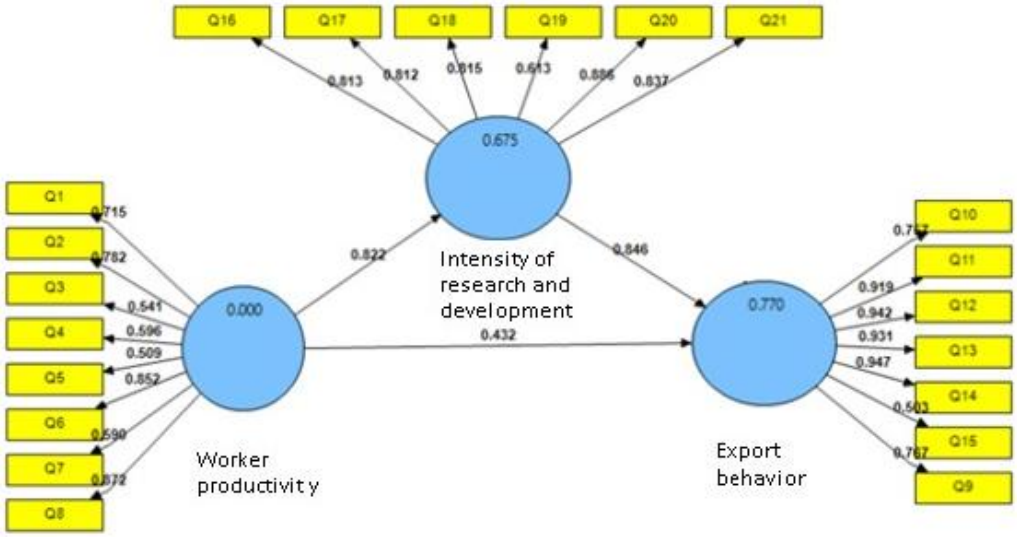

Fig.3: Structural model of standard research

The values of path coefficients and t-statistic along with the results of the hypotheses are presented in Table 5.

Therefore, data analysis by PLS software, the results of rejecting or confirming the hypotheses in Table 5 are significant.

Table 5: Hypothesis test results

Variables	Path coefficient	Statistics t	Result
H1: Employee productivity has a significant effect on export behavior	0/732	3/868	Confirmation
H2: Intensity of research and development has a significant effect on export behavior	0/822	9/362	Confirmation
H3: Staff productivity has a significant effect on the intensity of research and development	0/846	4/337	Confirmation
H4: Employee productivity has a significant impact through the intensity of research and development	0/359	5/038	Confirmation

CONCLUSION

The present study examined the effect of workers' productivity and the intensity of research and development on the export behaviors of small and medium export companies in Khorasan Razavi province. In order to achieve this goal, the subject matter study was reviewed and finally finalized in the framework of research theory. At the time of the presentation of the hypothesis, the research on the basis of the hypothesis was taken. In order to test the relevant data, the data of the research were analyzed using various technical data obtained in the next section of the data. Based on this, the following suggestions are made:

In order to develop the information capability in the market in the field of export behavior, company managers should pay attention to the opinions and suggestions of employees and use their more experience in creating, developing and maintaining regular productivity also, in order to achieve higher levels of productivity, research and development in domestic markets must be considered. Managers who are export drummers¸ they can improve export productivity by using innovative systems based on product behavior and development capabilities, working with customers, focusing on decision-making, using interdisciplinary workgroups, and flexibility of job responsibilities.

It is suggested that due to the existing sanctions and low access of companies to global technologies, the government should provide government arrangements and facilities for companies exporting new technologies based on behavior in the export market so that companies can achieve their strategic goals in this way.

Managers seek to strengthen and productivity of employees by holding related training courses and in line with the export program and use export agents to obtain information from foreign markets, and decentralized approaches to export development.

It is suggested that committees and groups of experts be formed in the company with the approach of developing export behavior to create and produce information ¸ to be able to identify customers and competitors and plan to implement the company's export policies and provide more use of business opportunities. In this regard, intensive training program on developing human resource capabilities is one of the most successful approaches to improve export productivity.

It is suggested to form and produce information, committees and teams of experienced and knowledgeable managers in the company with the approach of uncertainty in the export market¸ to be able to identify customers and competitors and plan to implement the company's strategic policies to be coordinated and provide more use of research and development. In this regard, team building is one of the most effective approaches to improve export performance.

It is suggested that the managers of export companies, by applying research and development based on the knowledge of experienced managers and facilitating the process of creating and disseminating information among the departments¸ increase their knowledge of foreign distributor market environment, business operations and general foreign customer relations (reducing communication distance) and by reducing the research sector in the relevant unit, reduce their dependence in terms of innovative ideas and research and development models.

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

In the present study, despite the full coverage of the research objectives, due to limited access to resources (financial and temporal), a number of limitations are observed. The first limitation is related to the data. Due to the fact that the data was collected from the city of Mashhad, as a result, the results cannot be generalized to all managers of small and medium-sized export companies throughout the country. Future studies can cover this limitation by considering sampling on a larger scale. The second limitation is in research methodology. Because export behavior is a mental and unconscious process¸ therefore, it is suggested that in future researches, in order

to increase the validity of the results, experimental (experimental) methods and design of different scenarios be used instead of survey methods to study the productivity and intensity of research on development and export behavior.

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