

# The Influence of Knowledge Management Factors on Food Exports in Iran

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## Abstract

The present study aims to investigate the effective variables of knowledge management in food exports in Iran. A new model was designed in this research on the basis of achieved statistical data from production associations and export firms. Structural equation modeling (SEM) was applied to assess the impact of effective variables of knowledge management in food exports. Suggested model of the research is comprised of eight dimensions which are as follows: specialized relations, coordinated knowledge, knowledge tools, organizational knowledge, knowledge process, knowledge chain, knowledge hardware, and knowledge feasibility. Target population of the study was consisting of 57 production associations which export food from Iran. The sales staffs and business departments formed the target population, and 317 questionnaires were validly obtained to test the research model. Exploratory factor analysis and Amos software were utilized for modeling. This study indicates that knowledge management is positively effective in the process of food exports in Iran, and all effective factors of knowledge management significantly affect the efficiency and performance of exporting. Eight-dimensional model which is suggested in this research introduces a practical strategy of evaluating the effective factors of knowledge management in food exports.

**Key Words:** Knowledge management, food exports, Structural Equation Modeling (SEM), Iran

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## Introduction

One of the most important issues of economy in Iran is the growth of non-oil exports. However, the obtained non-oil income is considerably less than oil-income. Furthermore, at the section of non-oil exports, it is dominated by traditional and agricultural products. In Iran, types of foodstuffs are influenced by specific geographical features of Iran which help the growth of non-oil exports. During the last years, non-oil exports can be considered as one of the highest sources of income in Iran, which shows a growth rate of employment of 7%. Millions of people's livelihood is dependent upon food exports.

Knowledge management is a powerful tool that can create changes in the world and make innovations possible, but it is transient concept which will disappear in the near future. The real value of knowledge was known when its capabilities were accepted by the people and their pessimistic view about the knowledge changed. In fact, there is no united definition of knowledge management, although it cannot be considered as a downside or difficulty, but its strength and potential power which can transfer knowledge inside and outside the business organizations (Fateh et al., 2009). According to Malhotra (2001), three processes comprise knowledge management: knowledge acquisition (internalization), knowledge codification (externalization), knowledge transfer. Hales (2001) revealed the concept of knowledge management in relation to the concepts of data, information and knowledge. He believes that the main problem in knowledge management is that organizations do not know how to turn data into information and information into knowledge. Wiig (2000) defines knowledge management as making processes to recognize and obtain needed data, information and knowledge from internal and external environments and apply them in decision-makings or organizations' proceedings. According to Hoffman et al. (2005), knowledge management is comprised of knowledge creation, share, transfer and protection in a way that it can be effectively employed in the organization. Ganderi et al. (2010) believe that knowledge management is consisting of four elements: knowledge, management, information technology, and organizational culture. Hoffman et al. (2005) consider knowledge as a type of knowing which exists in individuals' experiences, skills, capabilities, abilities, talents, thoughts, beliefs, work attitudes, aspirations, and imaginations. It can be seen in the process of a firm's tangible artefacts, work processes, and routines, and it can be also divided into two types of tacit and explicit. Jafari et al stated that Knowledge management is known as a systematic, goal oriented application of measures to steer and control the tangible and intangible knowledge assets of organizations, with the aim of using existing knowledge inside and outside of these organizations to enable the creation of new knowledge, and generate value, innovation and improvement out of it. They divided knowledge into tacit and explicit. Tacit knowledge forms the expertise, specific issues and cognitive knowledge consisting of thoughts, concepts, beliefs and mental models and institutions, and knowledge maintenance, and explicit knowledge composes theoretical approaches, problems solving, guidance and databases Ghazi Zadeh Fard (2008) believes that information technology is regarded as a powerful tool which can provide efficient and effective instruments for all dimensions of knowledge management consisting of knowledge capture, share and application. In order to convert information into knowledge, people should be capable of analyzing, interpreting and understanding knowledge and place it

in a special context. Davel and Snyman (2007) believe that all organizations are required of organizational culture (corporate culture), which refers to supportive relations, corporations and friendly environment, in order to implement knowledge management. They have to share needed knowledge to be able to execute organizational activities easily and use new approaches in the organization. Tendency or reluctance towards power culture can affect knowledge management implementation. Gold et al. (2001) and Demarest (1997) considered organizational culture as one of the most important infrastructural variables to implement knowledge management. Organizations should naturally have an appropriate culture to implement knowledge management. The existence of trust culture can augment mutual trust between members of the organization and also encourage them in the implementation of knowledge. Furthermore, organizations need a continuous acquisition culture to be successful in the process of implementing knowledge management (Nedlela & Toit, 2001). Exporting is the easiest way of entering foreign market. Case exporting refers to selling goods and services produced in the home country to other markets, since there is a surplus of those goods and services in the home country. Active exporting stands for the time a home country decides to export its goods to another country. In both types, there is a change of ownership from a resident to a non-resident; the home country produces the goods in its own country and ships them to other countries. A change may also happen when exporting the products (Rousta, 2004).

### **Knowledge management**

Many scholars believe that knowledge management is a powerful tool that can create changes in the world and make innovations possible, but it is transient concept which will disappear in the near future. The real value of knowledge was known when its capabilities were accepted by the people and their pessimistic view about the knowledge changed. In fact, there is no united definition of knowledge management, although it cannot be considered as a downside or difficulty, but its strength and potential power which can transfer knowledge inside and outside the business organizations (Fateh et al., 2009).

Knowledge management is comprised of knowledge creation, interpretation, distribution, use, protection, maintenance and refinement. It is complicated not due to its relation with information technology but its consistency with other fields study such as knowledge psychology and business. Strategies and techniques of knowledge management is applied to manage human capitals. Considering all definitions of knowledge management, this conclusion can be drawn that there is an interrelation between theory and application in knowledge management (Demarest, 2007). According to Gottschalk (2006), knowledge management is a philosophy which consists of principles, processes, organizational structures, and applied technologies that help people in order to share and utilize knowledge to achieve their goals. Klopulus and Frapalo (2003) defines knowledge management as a process based on which the organization creates knowledge-based capitals and assets made of members' knowledge and thoughts. (Lee and Choi, 2003) stated that knowledge management accentuates the reapplication of previous experiences, placing emphasis on programming in order to change the outlooks. Knowledge management is a multi-dimensional concept which cannot be defined easily. According to Malhotra (2001), three processes comprise

knowledge management: knowledge acquisition (internalization), knowledge codification (externalization), knowledge transfer. Hales (2001) revealed the concept of knowledge management in relation to the concepts of data, information and knowledge. He believes that the main problem in knowledge management is that organizations do not know how to turn data into information and information into knowledge. Based on Newman's research (1999), knowledge management consists of four processes of knowledge creation, storage, transfer and application. Table 1 addresses the stages of knowledge management process in the research literature.

Table 1 Stages of knowledge management process

Stages	Authors
Creation, acquisition, conversion, application	Wiig, (1997)
Determine the need, acquisition, distribution, use	Davenport & Prusak (2008)
Mapping, acquisition and creation, packaging, storing, share, application, re-use	Despres & Chauvel (1999)
Knowledge defining goals, identifying, acquisition, developing, maintaining, sharing, application, evaluation	Probst, Raub & Romhard, (1999)
Creating, storing, transferring, using	Leinder & Alavi (2001)
Acquiring, organizing, sharing, application	Wong & Aspinwall (2004)
Acquiring, organizing, storing, and providing, sharing, evaluation	Jashapara (2004)
Creation, encoding, retrieval, use, distribution, validation followed up, personalization	Rao (2005)

## Exporting

Exporting stands for communicating professional markets and professionals of a market. Exporting starts by this communication. Foreign exchange earnings can enhance the amount of exporting goods and services to other countries, and as a result, the level of economic development will increase. It can keep the balance between commercial and economic activities, and should be specialized, since opportunities may be lost so fast in global markets. Exporting means overseas marketing to the countries which are culturally, economically, politically, socially and climatically different from the home country. So, appropriate and specific behavioural systems should be applied when exporting (Donker, 2010). By and large, it can be alleged that exporting is a system consisting of different components which are closely interconnected in order to efficiently operate the system (Cadogan, 2007).

### *The role of food industry in a country's industrial status*

Table 2 is a schematic image of the position of food industry in proportion to the country's industry. On the basis of this table, over the period of 2000-2004 food industry applied 16.6 % of the country's industrial workshops, 14.53% of industrial

employments, 13.01% of industrial investments, and 9.5% of value added; therefore, just 7% of industrial exports are at this industry’s disposal. As it can be noticed, the efficiency of labour force was in all cases less than 1 and the gap was gradually enlarging (Statistical center of Iran).

Table 2 Food industry among all industries from 2000 to 2004

Index	1379	1380	1381	1382	1383	Annual average
Number of workshops (%)	17.4	17.4	15.55	16.22	16.42	16.60
Employment	14.3	14	14.40	14.88	15.08	14.53
Investment	11.7	11.8	15.86	10.51	15.20	13.01
Value Added (%)	10	9.2	10.7	.9.32	8.21	9.5
Labor productivity	0.70	0.66	0.74	0.63	0.54	0.65
Value of production (%)	12.87	11.84	13.32	11.9	10.76	12.1
Export (%)	8.5	6.5	6.1	8.3	5.3	7

The research hypothesis is stated as follows:

H1: Effective factors of knowledge management affect food exports.

The research conceptual model showing the relationship between variables can be observed in figure 1.

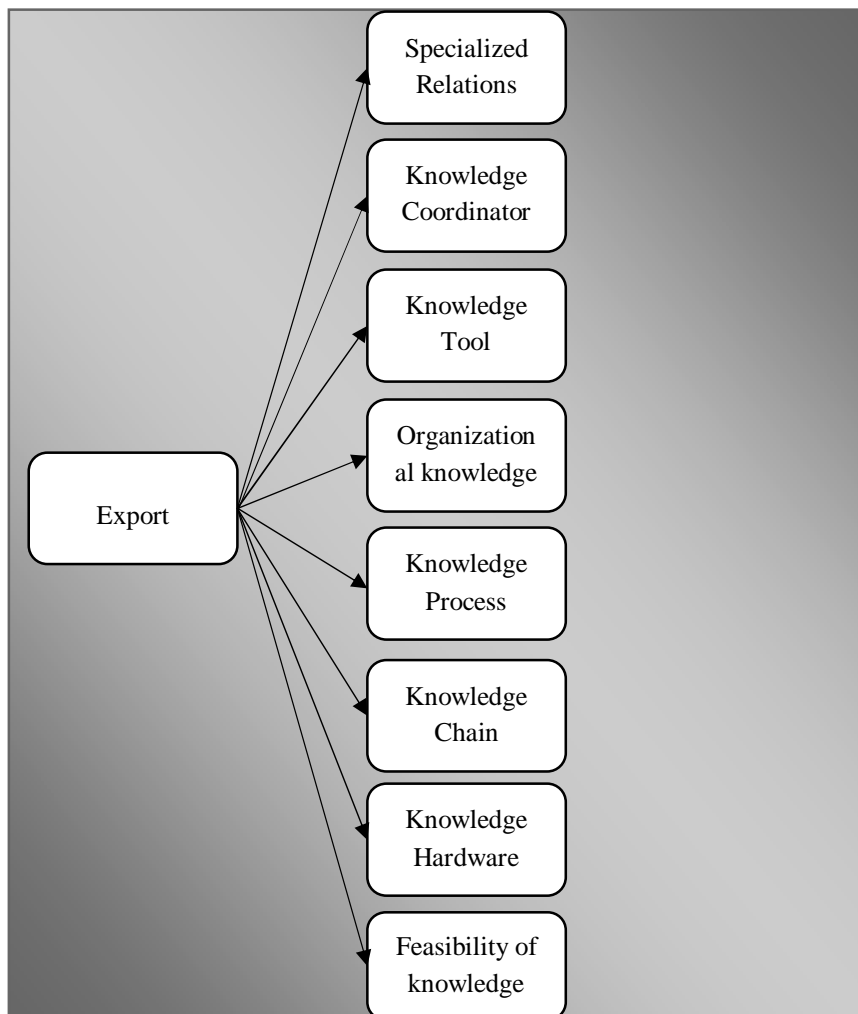


Figure 1 Research conceptual model

## Methodology

Considering the aims and data collection tools of the present study, it is an applied and descriptive research which used correlation coefficient and structural equation modeling. Confirmatory factor analysis and path diagrams were applied in the structural equation modeling. When testing a specific model of relations between variables, structural equation modeling is utilized. So it should be scientifically designed (Kalantari, 2003; Sarmad et al., 2005). There are generally two major points in management and behavioural sciences. The first one is associated with variables' evaluation and measurement which shows how to prove the model's validity. The second one is related to the cause and effect relationships between variables and the strength of their implementation. In other words, how can we infer the relationship between latent variables and indicators with error probability? How can we evaluate the final significant relationships between variables? (Kalantari, 2003).

The research was conducted among food exporters of Iran. A questionnaire comprised of 78 questions and Likert scale was distributed among insiders, experts and specialists in food exports. The assembled data were assessed through the application of factor analysis technique and then, Cronbach's alpha was calculated about 88% for remaining questions. Exploratory factor analysis was applied in order to recognize and discover the main dimensions and structures of the achieved data, and also distinguish the effective factors and variance of the factors, and prioritize the effective factors of knowledge management in food exports. Different stages and results can be explained in the following manner:

Data matrix of factor analysis should be consisting of significant information. Information significance can be shown through Bartlett's chi-square test. The significance of  $\chi^2$  and Bartlett's test are the least requirements of executing factor analysis. Considering the amount of KMO which is 0.747 and significance level of 0.000 in Bartlett's test of sphericity in table 3, the questionnaire's questions can be tested by exploratory factor analysis. The result

Table 3 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.747	
Bartlett's Test of Sphericity	Approx. Chi-Square	9214.15
	Df	595
	Sig.	0.000

Having conducted two aforementioned tests, exploratory factor analysis was utilized to assess and recognize the main factors and discover the specific features and relations between them. One of the most common ways of calculating the factors is using Eigen value which shows the amount of variance in the set of primary variables and is determined by a factor. In other words, the value of each factor is the indication of all components which are determined by that factor. The more the amount of this factor is, the more the level of variance will be. The factors whose values are more than

1 are regarded as the best factors. Table 4 explores the Eigen value and explained variance of extracted factors.

Table 4 Eigen value and explained variance of extracted factors

Factor	Compressibility (%)	Explained variance (%)	Eigen value
1	24.415	24.415	8.545
2	15.674	40.089	5.486
3	9.262	49.351	3.242
4	6.954	56.304	2.434
5	5.638	61.942	1.973
6	4.294	66.236	1.503
7	3.472	69.707	1.215
8	3.050	72.758	1.068

As it can be noticed, the values of 8 factors, among 35 factors, were more than 1 and therefore, the shared variance of the variables for these 8 factors consist 72.758% of the whole variables' variance. The accuracy of these 8 factors was more than 72%. The proportion of the first factor with the value of 8.545 was about 24.415% of the whole variables' variance.

### Research results

After determining the factors which experimentally belong to each other, experimental interconnection of the variables which affect a specific factor should be analyzed on the basis of conceptual sharing.

Regarding review of literature and the level of factor loading, the following naming was employed after consulting with supervisors and advisors:

Table 5 Factors, materials and factor loadings of related materials to effective elements in food exports

Factor	Materials	Factor loading
Specialized Relations	Motivation	0.874
	Facilitate relationships	0.870
	Organizational Structure	0.841
	Idea	0.811
	Organizational effectiveness	0.767
	Specialization	0.762
	Leadership	0.752
Knowledge Coordinator	Coordination	0.892
	Competitive Advantage	0.827
	Identification of knowledge	0.823
knowledge Tool	Intellectual Capital	0.845
	Assessment of knowledge	0.842
	share of Knowledge	0.819

Organizational knowledge	Organizational Intelligence	0.903
	Staff skill	0.895
	Experience	0.739
Knowledge Process	transfer of knowledge	0.842
	Human Resource Management	0.733
	save of knowledge	0.693
Knowledge Chain	base of knowledge	0.810
	economy based Knowledge	0.726
	Integration of knowledge	0.688
Knowledge Hardware	Knowledge Assets	0.640
	Distribution of knowledge	0.540
Feasibility of knowledge	Knowledge acquisition	0.808
	Mechanisms of software	0.639

According to the achieved data, 8 effective factors of knowledge management on food exports are specialized relations (with 7 Likert-type scales), coordinated knowledge, knowledge tools, organizational knowledge, knowledge process, knowledge chain (each with 3 Likert-type scales), knowledge hardware, and knowledge feasibility (each with 2 Likert-type scales). These factors were ordered apropos of their importance in confirmatory factor analysis section.

Table 6 Assessment of normality

Variable	Min	Max	Skew	Cr.	kurtosis	Cr.
Acquisition Knowledge	1.0	5.0	.13	.97	-.40	-1.47
Mechanisms of Applications	1.0	5.0	.39	2.84	-.22	-.82
Transfer of Knowledge	1.0	5.0	.31	2.26	-.26	-.97
Integration of knowledge	1.0	5.0	.28	2.08	-.31	-1.15
Save of knowledge	1.0	5.0	.00	.03	-.22	-.79
Human Resource Management	1.0	5.0	.04	.33	-.67	-2.45
Experience	1.0	5.0	-.048	-.35	-.82	-3.00
Staff skills	1.0	5.0	.011	.08	-.62	-2.28
Organizational Intelligence	1.0	5.0	.51	3.74	-.19	-.69
to share of Knowledge	1.0	5.0	.65	4.78	.06	.24
Knowledge Assets	1.0	5.0	.78	5.73	.46	1.69
Intellectual Capital	1.0	5.0	-.26	-1.92	-.94	-3.41
Identification of knowledge	1.0	5.0	-.23	-1.73	-.67	-2.46
Competitive Advantage	1.0	5.0	.093	.67	-.53	-1.92
Coordination	1.0	5.0	.41	3.04	-.53	-1.95
Leadership	1.0	5.0	.22	1.66	-.539	-1.96
Specialization	1.0	5.0	.03	.22	-.87	-3.16
Organizational effectiveness	1.0	5.0	.12	.94	-.59	-2.15
Idea	1.0	5.0	.40	2.90	-.31	-1.14
Organizational Structure	1.0	5.0	.56	4.11	-.15	-.54
Facilitate relationships	1.0	5.0	.31	2.26	-.14	-.53
Distribution of knowledge	1.0	5.0	.00	.05	-.54	-1.97
Integration of knowledge	1.0	5.0	.55	4.06	.01	.03



economy based Knowledge	1.0	5.0	.09	.68	-.32	-1.19
Base of knowledge	1.0	5.0	.12	.88	-.30	-1.11
Motivation	1.0	5.0	.33	2.41	.14	.53
Multivariate					145.61	33.97

According to table 6, absolute value of the critical ratios of skewness and kurtosis for some of the abovementioned variables was less than 2.58 and for some of them was less than that. So, some of these variables are normal and some of them are not. Meridia coefficient equalled 145.610 in the last line, critical amount was 971.33 which was more than 2.58, so 26 variables do not possess multivariable normal distribution, and the estimations of maximum method show lower level of standard error likelihood. Consequently, some of them which do not have significant difference with zero cannot be rejected. If this problem cannot be resolved by omitting multivariate normal outliers, bootstrap method and its comparison to other methods that do not need normal hypothesis can be applied.

Table 7 Structural model fitness indices for exports

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	59	1111.26	292	.000	3.806
Saturated model	351	0.000	0		
Independence model	26	3327.74	325	.000	10.239

Table 8 Baseline comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.666	.628	0.730	0.696	.727
Saturated model	1.000		1.000		1.000
Independence model	0.000	.000	0.000	0.000	.000

Table 9 Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.898	.598	.653
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

Table 10 RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	0.094	0.088	0.100	0.000
Independence model	0.171	0.166	0.176	0.000

Tables 7, 8, 9, 10 address the indices of absolute, comparative and economical fitness

Index of absolute fitness is the proportion of chi-square of structural modeling to the freedom degree equals  $CMIN/DF=2/105$ , and  $P=0.000$  that is less than 5%; therefore, null hypothesis, which states that the above model is justified and acceptable

by the society, is rejected. The volume of the above sample can be considered as one of the reasons which produced this result. Other indicators' testing is also recommended.

Indices of comparative fitness were all less than 90%, so they have weak fitness needing some modifications.

Indices of economical fitness were more than 50% which shows the goodness of fit, but the level of RMSEA was not less than 5% (more than 9%).

Table 11 Coefficient of importance of each effective factor of knowledge management in food exports

Factor	Variable	Importance Coefficient
Specialized Relations	Motivation	0.83
	Leadership	0.72
	Organizational effectiveness	0.69
	Ideas	0.66
	Organizational Structure	0.65
	Specialization	0.62
	Facilitate relationships	0.58
Knowledge Coordinator	Identification of	0.84
	Competitive Advantage	0.81
	Coordination	0.51
Knowledge Tool	Knowledge Sharing	0.68
	Intellectual Capital	0.61
	Assessment of Knowledge	0.56
Organizational knowledge	Staff skills	0.89
	Experience	0.84
	Organizational Intelligence	0.41
Knowledge Process	Human Resource Management	0.81
	Remember Knowledge	0.65
	Knowledge Transfer	0.74
Knowledge chain	Knowledge Base	0.77
	Knowledge-based economy	0.76
	Integration of knowledge	0.71
Hardware knowledge	Knowledge Assets	0.70
	Distributed Knowledge	0.61
The feasibility of knowledge	Mechanisms and Applications	0.76
	Knowledge acquisition	0.66

Table 12 Effective factors of knowledge management in food exports

Dependent variable	Important factor	Exploratory factor
Export	1.03	Hardware Knowledge
	0.97	Knowledge Chain
	0.97	Feasibility
	0.95	Knowledge Process
	0.94	Knowledge Tool
	0.91	Knowledge Coordinator
	0.87	Specialized Relations
	0.75	Organizational knowledge

Table 13 Research findings

Hypothesis	P-Value	Estimate	confirmed
Specialized relationships impact on increasing food exports.	P<0/001	1.000	Yes
Knowledge of food is matched by an increase in exports.	P<0/001	.526	Yes
Knowledge and tools to increase food exports are affected.	P<0/001	.616	Yes
Food exports will affect corporate knowledge accretion.	P<0/001	.333	Yes
Knowledge is a process of accretion food exports.	P<0/001	.551	Yes
Knowledge chain of food exports are on the rise.	P<0/001	.566	Yes
Hardware knowledge of food exports are on the rise.	P<0/001	.555	Yes
Feasibility and impact of the increase in food exports.	P<0/001	.526	Yes

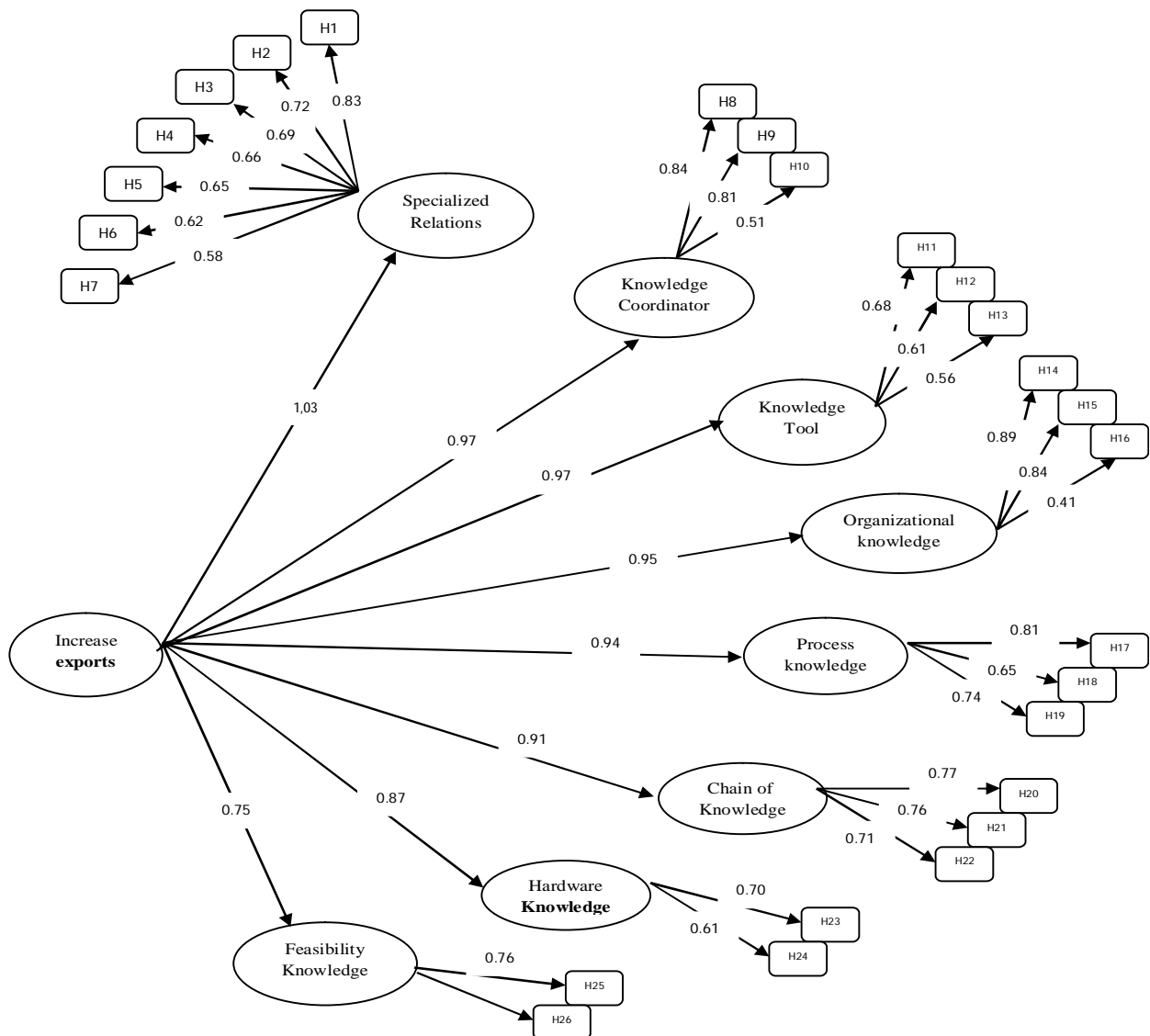


Figure 2 Path analysis

### Conclusion

During the process of validation, two main components of exploratory factor analysis demonstrated the existence of 8 aforementioned dimensions in theoretical area. Thus the obtained findings of this study can be efficiently employed by sale staffs and business departments as the competitive advantages of increasing the level of food exports. By and large, this conclusion can be drawn that knowledge management can significantly affect and increase the level of food exports. In the current study, eight

factors of specialized relations, coordinated knowledge, knowledge tools, organizational knowledge, knowledge process, knowledge chain, knowledge hardware, and knowledge feasibility, and also their effects on food exports were examined. The findings demonstrated that all factors were significantly and positively effective in increasing the profitability and competitive advantages. Thus the companies can consider these factors as profitable and distinguishing elements in the market which can absorb the customers.

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