Cumhuriyet Üniversitesi Fen Fakültesi
Fen Bilimleri Dergisi (CFD), Cilt:36, No: 6 Özel Sayı (2015)
ISSN: 1300-1949

Cumhuriyet University Faculty of Science
Science Journal (CSJ), Vol. 36, No: 6 Special Issue (2015)
ISSN: 1300-1949

Analyzing the Causal Model for the Effect of Organizational Factors, Human Resources and Technology on Agility of the Iranian Maritime Transport Chain through Structural Equations Modeling

Hossein FARSIJANI[1], Masoud KASAEI[2], Mohammadreza HAMIDIZADEH[3], Mohammad SABETI[4]

[1]*Associate Professor, Faculty of Management and Accounting, Shahid Beheshti University, Tehran, Iran*
[2]*Assistant Professor, Faculty of Management and Accounting, Shahid Beheshti University, Tehran, Iran*
[3]*Professor, Faculty of Management and Accounting, Shahid Beheshti University, Tehran, Iran*
[4]*Phd Student, Faculty of Management and Accounting, Shahid Beheshti University, Tehran, Iran*

Received: 24.04.2015; Accepted: 09.07.2015

Abstract. The main objective of this study was to design and clarify a causal model for the effect of organizational factors, human resources and technological factors on the agility of the Iranian maritime transport chain. The causal relationships in the proposed model were designed by studying and applying the previous agility theories and models as well as by analyzing the business structure of the maritime transportation industry in Iran. The following four components were classified and included in this model: human resources agility, technological agility, organizational factors agility, and maritime transport chain agility. Accordingly, five hypotheses were developed for testing the fit of the maritime transport chain agility model and the effect of the other three components on this component. The data for this research was collected using a questionnaire and the statistical population included the experts and managers working for the Iranian transportation industry organizations. The sample size was calculated to be 255 but only 229 participants completed and returned the questionnaires. The structural equations method was employed to test the research hypotheses and the model fit. Results of the analyses revealed the good fit of the maritime transport chain agility model. Moreover, all of the five secondary hypotheses except for the hypothesis on the direct effect of organizational factors on the transport chain were approved.

Keywords: Iranian maritime transport chain agility; organizational factors agility, human resources agility, structural equations modeling

1- INTRODUCTION

Today, about 90% of world commerce is handled through maritime transportation systems (UNCTAD report, 2013-2014). This is because this type of transportation has advantages (such as low cost, transfer of large volumes of goods, and quick and risk-free transfer of goods) over other transportation means. As a result of these advantages the maritime transport chain, especially seaports, has drawn special attention. This chain plays a key role in the foreign trades of countries and is one of the important logistical components of trade. This component also forms the main basis of commerce and is the main component of the supply chain. Hence, possession of an agile and efficient maritime transport chain is considered among the sustainable competitive advantages of countries. However, the statistics published by the United Nations Conference on Trade and Development (UNCTAD) and the World Bank indicate that in spite of the distinctive geographical position and the placement of Iran on the important transportation corridors (including the North-South and East-West corridors), the Iranian maritime transport chain and its seaports (which are the nucleus and the main coordinator of this chain) own a small share of goods transit and travels as compared to the countries of the world and the region. One of the most important reasons for this situation is the lack of concern for agility and the effect of factors influencing the maritime transport chain, especially the technological factors, organizational factors, and human resources. In other words, the custodians of this chain have failed to develop and make the human resources, organizational factors, technological factors and the maritime transport chain agile in accordance with the environmental changes and needs.

In order to support this argument it is possible to refer to a report on the logistic performance index (LPI) of countries, which was published in 2014 by the World Bank. According to this report, among the 155 rated by this survey, Iran had the 78, 102, and 112 ranks from 2007 to 2014 and had a higher

* Corresponding author. *Mohammad SABETI*

Special Issue: International Conference on Non-Linear System & Optimization in Computer & Electrical Engineering

rank than the other 155 countries in 2014 (Herampey Consulting Engineers, 2014). In addition, the duration and final cost of the export and import operations in Iran are very high compared to other countries especially the Arab Emirates.

Table 1. Comparing the imports and exports of Iran and other four countries in 2013.

Processes	Iran	United Arab Emirates	South Korea	Singapore (first place)
Export process:				
Number of export documents	7	4	3	4
Duration of preparation of export documents (day)	25	7	7	5
Costs of exporting one container (dollar)	1470	630	665	456
Import process:				
Number of import documents	8	5	3	4
Duration of preparation of import documents (day)	32	7	7	4
Costs of importing one container (dollar)	2100	590	695	439
Total stand among 185 countries	145	26	8	1

Source: Doing Business 2013 report by World Bank

A close examination of the results of studies and reports published by UNCTAD and World Bank reflects the inefficiency and ineffectiveness of the processes, structures, human resources, systems and other factors associated with the Iranian maritime transport chain. Because of these challenges, the Iranian maritime transport industry owns a slight share (about 0.5%) of the international maritime transport market and thus the country has failed to keep up with its 1404 Horizon Plan and rivals (UNCTAD, 2013). Therefore, it is concluded that it is a necessity to make the processes, structures, and other organizational, human resources and technological factors associated with the Iranian maritime transport chain agile, easier and more flexible. Hence, the objective of this study was to design a causal agility model for the Iranian maritime transport chain so as to improve the place of Iranian seaports among the rivals. Other objectives were to increase Iran's market share, attain the goals of the National 1404 Horizon Plan, and actualize the resistive economy theory in the maritime transportation sector.

Theoretical Basics and Research Background

Definitions of Agility

The word "agile" is defined as "a rapid, sharp and active movement" in the dictionaries and the word "agility" refers to the ability to move quickly and easily and to think sharply and quickly (Hornby, 2000). Catayama et al. (1999) defined agility as the ability to confront and adapt to market fluctuations and changes using a quick and continuous economic method. That is, agility is the ability to meet the needs of customers with regard to the price, quality and speed of delivery of products (Fatahi Hafshanjani et al., 2012). In another definition, Brian Maskel (2001) defines the notion of agility as the ability to blossom and flourish in an ever-changing unpredictable environment (Nikpour, Barkam, 2012, p. 5). Most scholars and researchers emphasize on the ever-changing unpredictable nature of the environment and the ability of organizations to adapt to and keep up with this environment. According to some researchers, environmental adaptability is obtained by making human resources and organizational factors agile by, for example, designing organic structures for having flexible and lower levels of formalization (Burns & Stalker, 1961; Hage & Aiken, 1969; and Hage and Dewar, 1973). In the studies in 1980s, the focus of most researchers was on organizational flexibility. Reed and Blusdon (1998) defined organization flexibility as the ability of the structure, employees, processes and other factors involved in an organization to meet market demands and adapt to environmental changes (Layer, 2007).

Based on the aforementioned definitions of agility it can be stated that today's organizations operate in an environment, which makes them adopt adaptable strategies because of its rapid unpredictable changes. The approach which is based on the change and agility of the maritime transport chain and seaports and is closely associated with international/global trade (and ultimately influences any change in the market and the international environment) is not an exception. Changes in the supply chain management have considerably influenced this chain. Shipping lines, terminal operators, shipping agents and forwarders shall provide a wide range of services to win the satisfaction of their customers. Provision of services that match customer demands, calls for innovation and a high level of flexibility. Therefore, all of the organizations related to the maritime transport chain and seaports shall be agile and quick to be able to adapt to the environment.

Organizational Agility Models and Studies

Since the development and spread of the agility paradigm, organization managers and intellectuals have examined agility with different approaches and have proposed various models from different viewpoints to make their organizations agile. Some of the studies and models include the ones by Alexopoulou et al. (2009), the ZenithResearch website (http://zenithresearch.org.ir, 2012), Fathian et al. (2009), Farzaneh et al. (2011), Asari et al. (2014), Prenald (2012), Gunasekaran (1999), and Gong Bing Bi Zhoa & Chai (2012). Each of these studies and models highlights one or several dimensions of organizational agility. For instance, Beskovnik and Twrdy stressed seaports and the agile transport model, the ZenithResearch website emphasized on the new role of seaports in global supply chain agility, and Farzaneh et al. highlighted organization dimensions of agility. Moreover, Jafarnezhad & Darvishi introduced an agile supply chain and Khosravi et al. (2012) studied human resources agility. Muhammadi & Amiri (2012), Asari et al. (2014), and Gong et al. (2012) also stressed the role of human resources in organizational agility. Finally, Prendal (2012) referred to the role of information technology in organizational agility while Meziani et al. (2009) stressed the effect of agile business processes on organizational agility. In order to understand the dimensions, means and functions of transport chain agility some of the models forming the basis for the research conceptual framework are introduced in the following.

1) Seaport Effectiveness and Agility Model by Su Han Woo (2010)
In a research titled "seaport supply chain integration and orientation", Su Han Woo developed a model for the effectiveness and agility of seaports. The hypotheses and results of his model suggest that the seaport supply chain and seaport supply chain integration improve the effectiveness and agility of seaports. He classified the criteria for measuring the effectiveness and agility of seaports in two groups: 1) high quality services, customer-orientation, and service prices; 2) efficiency and effectiveness of marine and seaport operations as well as operations related to goods. He also classifies the maritime or seaport transport chain indices into the following two categories:

- Seaport integrated supply chain indices: communications and information system, long-term relationships, organizational relationships, inter-modal transport, and supply chain integration methods.
- Seaport supply chain indices: financial resources, human resources, organizational relations, and support of senior managers.

Based on the above indices, the final seaport agility and effectiveness model was developed as follows.

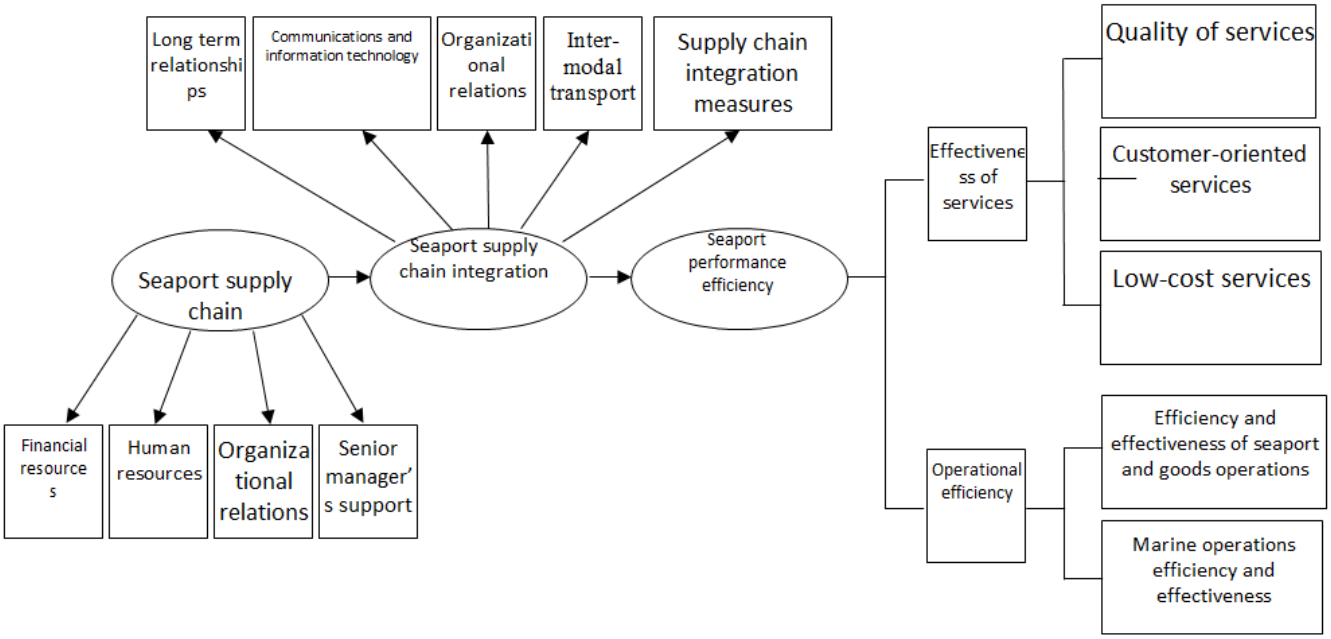

Figure 1. Seaport (maritime transport chain) effectiveness and agility model by Su Han Woo (modified by the researcher).

2) Agile Seaport and Inter-Modal Transport Model by Beskovnik et al. (2011)

In order to explain their maritime transport chain model, Beskovnik and Twrdy argued that supply chain directly affects the maritime transport industry. In this chain, shipping lines, terminal operators, shipping agents and forwarders conduct different operations to meet the needs of the customers and win their satisfaction. Lean maritime transport logistics is based on providing safe, agile and flexible marine and seaport services. Hence, based on the competitions in the transport market and financial crises, transport logistics aims to utilize chances to be able to manage time, space (storages and transport terminals), and information exchanged between production and consumption centers.

After studying the traditional maritime transport chain, the aforementioned researchers found out that the maritime transport process includes seven members or nuclei. The number of the members and the necessity of the exchange of information and services among these nuclei have led to the lack of flexibility and agility in service provision by this sector. They proposed a new model of the chain in which the number of the components (nuclei) was reduced to four and the maritime transport services provision was integrated. The models for the two chains (traditional and agile) are presented in the following.

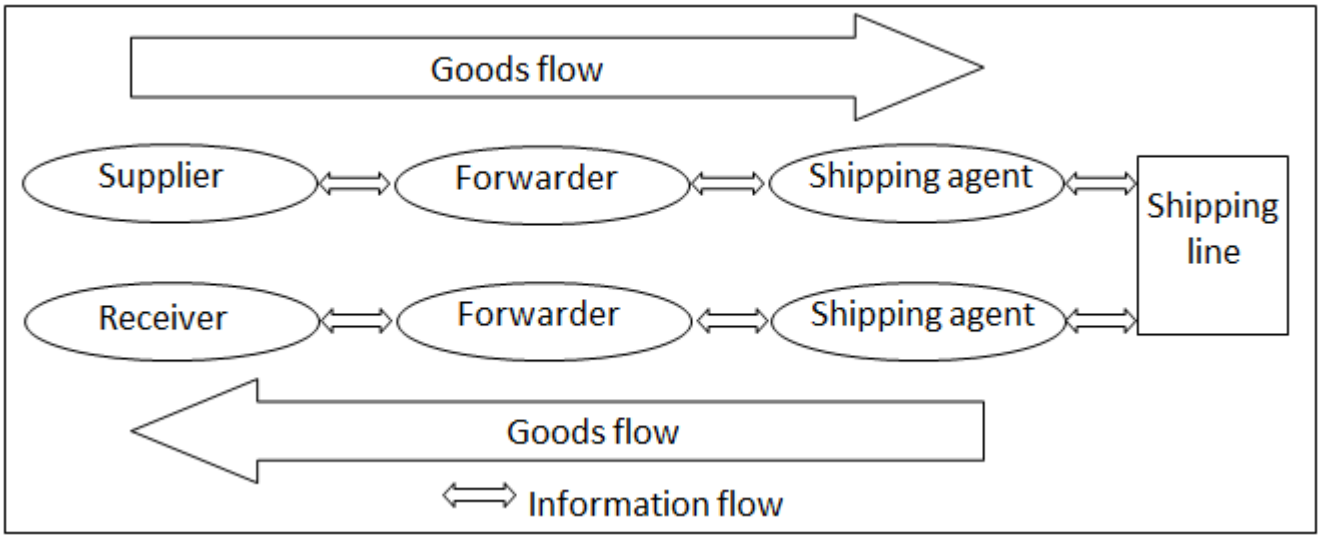

Figure 2. Traditional maritime transport chain (Source: Beskovnik and Twrdy (2011)).

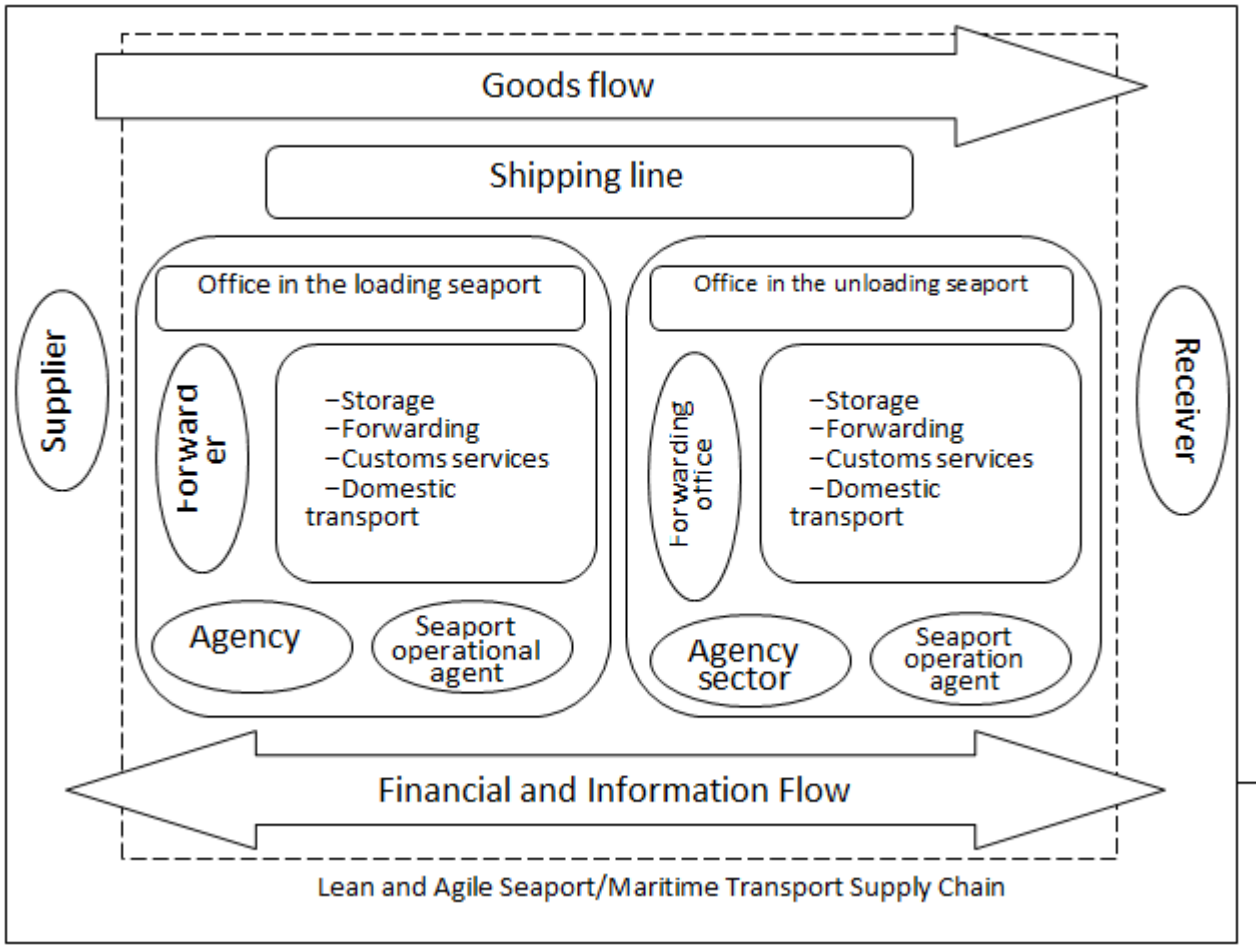

Figure 3. Agile seaport/maritime transport services chain by Beskovnik and Twrdy (2011), Source: Beskovnik and Twrdy (2011).

In designing the primary conceptual framework for this research in addition to the above models, the following models were used along with an analysis of the maritime transport chain structure (including seaports and appropriate organizations).

Table 2. Dimensions of the research causal model.

R	Component		Agility index	Source (designer and author of Agility Model)
1	Human resources agility	1	Training and empowering the employees	Sharifi & Zhang (1999); Yousef et al. (1999); Ganskaran & Yousef, Ganskaran & Dabi (2014); Dehmordeh et al. (2010); Sharp et al. (1999); Ziayi et al.(2012); Abayer (2012); Olfat & Zanjirchi (2009); Jafarnezhad (2008)
		2	Developing knowledge-centered human resources	Yousef et al. (1999); Ganskaran & Yousef (2002); Dehmordeh et al. (2010); Sharp et al. (1999); Ziayi et al. (2012)
		3	Global management (managers) development	Ganaskaran & Yousef (2002)
		4	Increasing the number of employees with IT skills and office staff	Ganaskaran & Yousef (2002); Ganaskaran adn Dabi (2014); Sharp et al. (1999); Azar et al. (2009); Olfat & Zanjirchi (2009)
2	Technological agility	5	Networks and advanced systems	Sharifi & Zhanf (1999); Yousef et al. (1999); Ganaskaran & Yousef (2002); Leen et al. (2008); Su Han Woo's model (2010); Sharp et al. (1999); Ziayi et al. (2012); Toliusiene & Mankute (2013); Azar et al. (2008); Momeni et al. (2012); Abayer (2012); Olfat & Zanjirchi (2009); Yousef and Krositov (2003)
		6	Advanced loading and unloading equipment	Maritime transport industry
		7	Advancement maintenance system	Maritime transport industry
3	Organizational factors agility	8	Organizational structure agility	Sharifi & Zhang (1999); Yousef et al. (1999); Su Han Woo's model (2010); Toliusiene & Mankute (2013); Dehmordeh et al. (2010); Momeni et al. (2012); Abayder (2012)
		9	Agility of operational and support processes	Leen et al. (2008); Beskovnik et al. (2011); Azar et al. (2009); Momeni et al. (2012); Jafarnezhad et al. (2008)
		10	Organizational strategies agility	**Sharifi & Zhang (1999); Ganaskaran & Yousef (2002); Dehmordeh et al. (2010); Momeni et al. (2012); Abayer &Sharifi (1998); Olfat & Zanjirchi (2009); Jafarnezhad (2008); Maritime transport industry**
		11	Customer relationship	**Yousef et al. (1999); Leen et al. (2008); Su Han Woo's model (2010); Ganaskaran & Dabi (2014); Maritime transport industry**
		12	Lean services	**Maritime transport industry**
		13	Improvement of safety and sailing services	**Maritime transport industry**
4	Supply chain agility	14	Using door-to-door transportation means	**Su Han Woo's model (2010); Supply chain model (2014); Maritime transport industry**
		15	Managing maritime transport chain relations (ships, seaports, good owners, etc.)	**Leen et al. (2008); Su Han Woo's model (2010); Beskovnik et al. (2011); Supply Chain Model (2014); Ganaskaran, Hotglai & Zhang (2006); Maritime transport industry**
		16	Logistic agility	**Su Han Woo's model (2010); Beskovnik et al. (2011); Supply Chain Model (2014); Maritime transport industry**
		17	Interest in third-generation seaports	**Beskovnik et al. (2011); Maritime transport industry**

Research Objectives

The primary objective of this study was to design, test and explain a model for the causal relationships among variables (including organizational factors agility, human resources and technological factors) that influence the extrinsic or dependent research variable (i.e. Iranian maritime transport chain agility) using the structural equations modeling method. In other words, according to the previous research and theoretical basics it is concluded that there seems to be a relationship between the independent and dependent variables studied in this research. Therefore, the objective of the present research was to design a transport chain agility model for the population under study and examine the relationships and direct and indirect effects of the independent (intrinsic) variables on the dependent (extrinsic) variable, being the Iranian maritime transport chain agility. To this end, the following causal model was proposed.

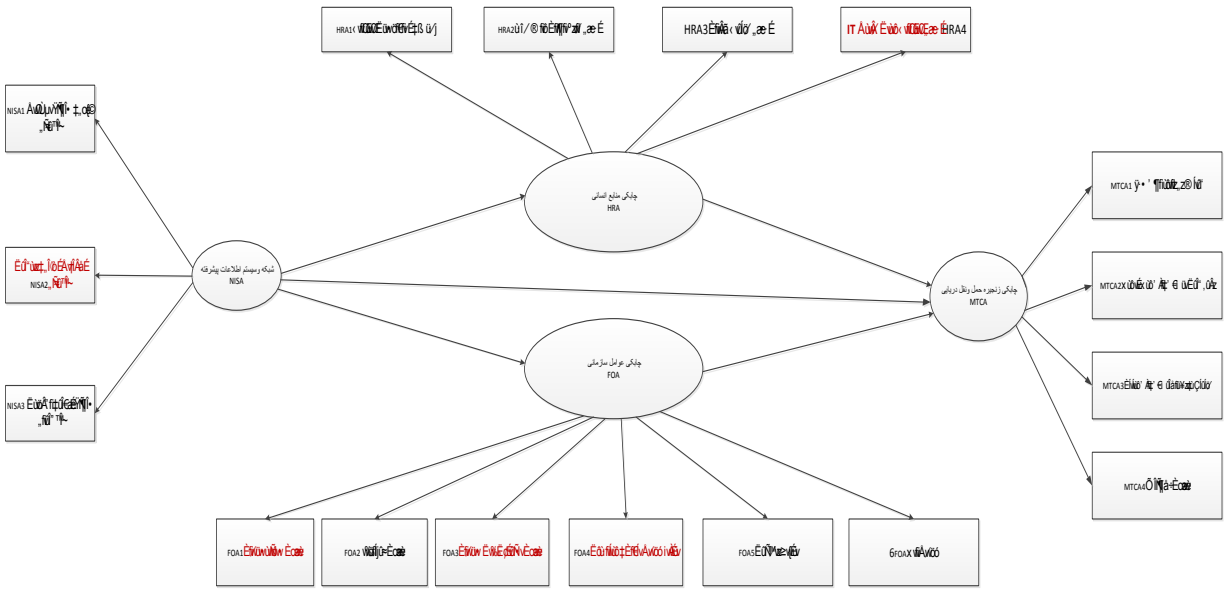

Figure 4. The basic conceptual framework for the causal relationship or effect of agility of organizational factors, human resources and technological factors on the agility of the Iranian maritime transport chain.

Research Questions

1) What is the agility model for the Iranian maritime transport chain?
2) How does each of the independent variables affect the dependent variable in the agility model for the Iranian maritime transport chain?

Research Hypotheses

A) Primary hypothesis: The model for the causal effect of the agilities of organizational factors, human resources and technological factors on the Iranian maritime transport chain agility fits the data.

B) Secondary hypotheses:

1) Technological agility (high technology) influences the maritime transport chain agility.
2) Technological agility (high technology) influences the agility of organizational factors.
3) Technological agility (high technology) influences human resources agility.
4) Human resources agility influences the maritime transport chain agility.
5) Agility of organizational factors influences maritime transport chain agility.

Research Methodology

A statistical method, which is known as the structural equations modeling method and is used in correlation studies, was used to examine the causal model proposed in this research. Moreover, based

on the objectives of this study this research can be classified as a correlation research in which the analyses were carried out using the structural equations modeling method.

Research Tools

In this study, a questionnaire was used to collect the data required for testing the goodness of fit of the agility model for the chain under study. The questionnaire was composed of four main components or variables as well as seventeen dimensions. Three components were defined as the independent variables and the fourth component (i.e. maritime transport chain agility) was defined as the independent variable. In order to assess the validity of the questionnaire, content and construct validity assessments were carried out. The content and face validity of the questionnaire was examined based on the opinions of academic elites and experts working for the maritime transport industry. The construct validity of the questionnaire was assessed through a confirmatory factor analysis using the LISREL statistical software. The reliability of the questionnaire was assessed using the Cronbach's alpha coefficient method. Assessment results revealed that the Cronbach's alpha coefficients for each of the dimensions of agility, which were calculated to examine the internal consistency of each of the questionnaire statements, were larger than 0.88. Hence, it can be stated that each of the dimensions had a high internal consistency.

Statistical Population and Sampling Method

The statistical population for this research included the experts and managers working for the maritime transport industry's organization (i.e. seaports, institutions, companies, and shipping lines associated with and present in the seaports all over Iran). Since Iranian seaports are located in seven provinces and since the structure of the study population was composed of distinct and defined classes, the random stratified sampling method was employed. The sample size was determined to be 255 based on the theories of the structural equations modeling theorists and 15 members were selected for each variable. The participants answered and returned 229 questionnaires.

Statistical Methods for Data Analysis and Testing Hypotheses

In this research, the structural equations modeling method (confirmatory factor analysis) was employed to test the causal model for maritime transport chain agility and identify the variables influencing maritime transport chain agility. In addition, the structural equations modeling method was used to test the research hypotheses (i.e. to study the causal relationships between variables or paths and corresponding coefficients). Descriptive statistics such as the mean value, standard deviation, and Kolmogorov–Smirnov statistic were also used to examine the normality of agility dimensions data. LISREL (version 8.51) was used to analyze the data.

Research Findings

A. Descriptive Findings

Table (3) presents the descriptive findings (including the mean and standard deviation) along with the Kolmogorov–Smirnov statistic for testing the normality of the data on each agility dimension.

Table 3. Mean and standard deviation of agility scales and the K-S statistic for normality tests (N=229).

Subscale	Mean	Standard deviation	Skewness	Minimum
Training and empowering employees	38.22	7.02	0.116	0.000
Knowledge-centered human resources development	38.77	7.22	0.120	0.000
Global management (managers) development	38.70	8.64	0.116	0.000
Expanding human resources with IT skills	39.25	7.60	0.107	0.000
Advanced information network and system	39.06	7.59	0.118	0.000
Advanced loading and unloading equipment	39.38	8.16	0.123	0.000
Advanced maintenance equipment	37.94	7.79	0.101	0.000
Organizational structure agility	37.65	8.19	0.084	0.000
Agility of operational and support processes	38.89	7.89	0.091	0.000
Organizational strategies agility	38.88	7.89	0.091	0.000
Improving seaport and marine safety	37.93	7.31	0.083	0.000
Customer relationship	38.58	7.73	0.100	0.000
Lean services	39.07	8.11	0.120	0.000
Interest of traditional seaports in the third-generation seaports	38.54	0.09	0.096	0.000
Door-to-door transportation	38.85	7.96	0.126	0.000
Maritime transport chain relationships management	39.16	8.33	0.095	0.000
Logistics agility	39.99	8.35	0.102	0.000

Table (4) shows the correlations among the components (variables) of the maritime transport chain agility. The information included in this table indicates that the correlations among all components are positive and the correlations are significant at the 1% error level. The correlation of all components with the general scale for the maritime transport chain agility is also positive and significant at an error level of 1%.

Table 4. Correlation matrix for the correlations between the components and the total agility score (N=229).

Component	Human resources	Technological agility	Organizational factors	Supply chain
Total score	0.947**	0.931**	0.966**	0.945**
Supply chain	0.864**	0.831**	0.880**	
Organizational factors	0.872**	0.872**		
Technological agility	0.873**			

** Significant at an error level of 1%

B) Findings about Research Hypotheses

1) Primary hypothesis: Table (5) shows the fit goodness indices of the Iranian maritime transport chain agility which was examined and fitted using the confirmatory factor analysis (structural equations modeling) method. Results of the structural equations modeling reflect the good fit of the model for the study population.

Table 5. Results of the fit indices of the proposed theoretical model.

Fit index	χ^2	Degree of freedom (df)	χ^2 / df	RMSEA	CFI[1]	TLI= NNFI	NFI	GFI	**IFI**	AGFI
Assessment criterion		**≥0**	**≤2**	**≤0.05**	**≥0.09**	**≥0.09**	**≥0.09**	**≥0.09**	**≥0.09**	**≥0.09**
Results of the confirmatory factor analysis (WLS)	142.85	115	1.24	0.033	0.99	**1**	0.99	0.99	**1**	0.99

According to Table (5), the value of the Chi square statistic is significant (X^2) at the 5% error level ($p<0.05$, $X^2(114)=142.85$). Since this index is sensitive to the increase in the number of samples it is significant in most cases. Hence, other indices or alternatives were used as explained in the following to ensure the good fit of the study model. As seen in Table (5), the Chi square to degree of freedom ration (X^2/df) is equal to 1.26, which is below 2 and is therefore suitable. The small value of this index reflects the slight difference between the primary conceptual framework of this research and the observed data or research results. In addition, the Root Mean Square Error of Approximation (RMSEA) obtained from the weighted least squares (WLS) method shows that the model is properly fit to the study population because the resulting value is lower than 0.05. Therefore, the fit of the research model is also confirmed using this index. Moreover, results presented in Table (2) reflect the goodness of fit of other indices of the structural model including the goodness of fit index (GFI), adjusted goodness of fit index (AGFI), normed fit index (NFI), Non-normed fit index (NNFI), comparative fit index (CFI), and incremental fit index (INFI). Hence, according to the results of the aforementioned indices it can be stated that using the confirmatory factor analysis method, the causal model proposed for maritime transport chain agility is confirmed for the statistical population under study.

Figure (1): The standard and non-standard factors for the theoretical model

2) Secondary hypotheses: Table (6) shows the significance of the direct and indirect effects of the variables of the proposed model on the maritime transport chain agility. As seen in this table, technology is the factor that has a direct significant effect on the organization and human resources factors at an error level of 1%. Therefore, the second and third hypotheses are approved. This factor also has an indirect significant effect on the transport chain at the 1% error level. Therefore, the first hypothesis is approved although indirectly. In addition, human resources agility has a significant direct effect on the transport chain at the 5% error level (hypothesis no.at the 1% error level. Therefore, the first hypothesis is approved although indirectly. In addition, human resources agility has a significant direct effect on the transport chain at the 5% error level (hypothesis no. 4). The direct effect of organizational factors on the transport chain is not significant at the 5% error level. Hence, the fourth hypothesis is rejected. It is worth mentioning that organizations factors influence the transport chain agility indirectly by affecting other factors.

[1] Comparative fit index

Table 6. The overall effects of factors influencing the transport chain agility in the theoretical model.

Factor	Standard effect	Total effect	Standard deviation	T-value	P-Value
Technological agility on organizational factors	0.99	1.13	0.018	64.45	<0.01
Technological agility on human resources	0.99	1.06	0.013	84.36	<0.01
Technological agility on transport chain	0.98	1.08	0.016	67.41	<0.01
Human resources on transport chain	0.62	0.60	0.028	2.13	<0.05
Organizational factors on transport chain	0.37	0.38	0.30	1.27	> 0.5

Conclusions

In this study, in order to study the effect of factors influencing the Iranian maritime transport chain a causal model composed of four components or variables (namely organizational factors agility, technological agility, human resources agility, and agility of the maritime transport chain) was designed and developed. The ultimate objective of the research was to design the proposed causal model, test the goodness of fit of the proposed model, and determine the impact factors for interrelationships among the paths and their relationship with the study chain. Based on the results of the statistical analysis for the secondary hypotheses, the relationships among the aforementioned hypotheses can be explained as follows.

1) No direct relationship was confirmed for technological agility (advanced technology) and transport chain agility, but based on the results of the statistical analysis presented in Table (6) and the approved causal model, the indirect relationship between two variables is approved. Hence, these two variables affect the agility of the transport chain.
2) There is a direct significant relationship between technological agility (advanced technology) and organizational factors agility.
3) There is a direct significant relationship between technological agility (advanced technology) and human resources agility.
4) There is a direct significant relationship between human resources agility and maritime transport chain agility.
5) Although the indirect effect of organizational factors agility on the maritime transport chain agility was approved in the causal model, there is no direct significant relationship between these two variables. Results of this research comply with the models and theories proposed by the organizational agility theorists, especially the theories mentioned in the research literature and background section and Table (2).

Suggestions

Based on the results the following suggestions are provided.

1) Based on the environmental changes and the new business relations established in the field of maritime transport, it is essential to make the current maritime transport chain agile using the causal model proposed in this research so as to create a sustainable competitive advantage for this sector. This procedure shall be updated based on the requirements of the field.
2) Since the maritime transport chain forms part of the logistics and transportation chain of the country, making this chain agile and improving its efficiency in accordance with other transportation sectors is a necessity and requirement.
3) Other countries, especially countries of the region (the rivals) are constantly expanding their investments and facilities, renovating the structures and processes, and developing human resources to increase their share of the maritime transport market. Therefore, in order to increase the Iranian transportation industry's small share of this market it is necessary to make the transport chain agile.

References

[1] Voomack, James, Jones, Daniel (2003). Lean thinking (eradication of losses and creation of value for organizations). Translated by Azadeh Radnezhad, Amuzeh Publications, Iran Naab Institute.

[2] Olfat, Liaz, Zanjirchi, Seyyed Mahmoud (2009). A model for organizational agility in the Iranian electronics industry. Iranian Management Sciences Quarterly, fourth year, no. 13, pp. 47-74

[3] Yaqubi, Nour Muhammad, Shakouri, Ali Verahat, Dehmordeh, Mahboubeh (2012). Studying the structural contributions of organizational agility to the banking system. Strategic Management Thinking, sixth year, no. 1, pp. 133-158

[4] Azar, Adel, Tizroo, Ali et al. (2011). Proposing a model for the supply chain agility (case study of Zob Ahan Company). Tehran University, Industrial Management Journal, no. 7

[5] Nikpour, Amin, Barkem Yaser (2012). Organizational agility and a model for having an agile organization. Yas Economical Strategy Journal, no. 30, pp. 151-171

[6] Vadadi, Hamid (2013). Future and the position of maritime transport and seaports. Center for Strategic Studies and Research

[7] Farsijani, Hassan (2004). Strategic planning challenges in dynamic quality management in the 21st century for world class productions. International Conference on Quality Management, Tehran (2004)

[8] Khoshsima, Qolamreza, Jafarnezhad, Ahmad and Mohaqar, Ali (2010). The effect of agile competencies on the production of companies manufacturing automobile parts and sets with the agile manufacturing system's BIZ network approach: framework and enablers (p. 163-171). Second national conference on industrial engineering, 2008, Yazd University

[9] Hooman, Heydar Ali (2012). Structural equations modeling in LISREL. Tehran, Organization for the Study and Development of Academic Human Sciences Textbooks (SAMT)

[10] Pabandeh Najaf Abadi, Amir Teymour; Amidi Najaf Abadi, Maryam (2013). Confirmatory structural analysis: path analysis, factor analysis, structural equations analysis. Tehran, Shahid Beheshti University, Publications Center

[11] Ports and Maritime Organization, Herampey Consulting Engineers, Designing the Persian Gulf Logistic Seaport, 2014.

[12] leffingwell, Dean ،(2013),Be agile. Scale up. Stay lean ,article from an internet database.

[13] Bishop, Tony ,(2013)Cloud empowere enterprise , A Strategic Framework to enable an agile enterprise , article from an internet database.

[14] mehrabian, Armond ,(2013),The Scaled agile Framework (Foundotion Of the scaled agile framework) ,article from an internet database.

[15] Werner , kim ,(2013)Scaled Agile Framework , article from an internet database.

[16] ching track , coa, (2013)agile learning Roadmap , enterprise Agile coa ching track , (2013)

[17] COBB, charls , (2013),managed agile development , making agile work for your Basiness.

[18] Attafar, Ali: ph.D university of Isfahan (march 2012), Study of Required organization Base for implementation of agility strategy in organization ,S (case study: industrial entekhab Group).

[19] Andrea leskovA, , Drsc, ph.D(2012) The study of Agility in production systems and agility metrics, model for Automotive suppliers , (prof.ing) Milan hovac

[20] GNICH, samira, (2012),Lean transportation, article from an internet database.

[21] mthupha, Bokang ,(2012), A framework for the development and measurement of agile enterprise Architc ture, article from an internet database.

[22] casey , Bradley, (2011) ,optimizing container processes at multimodal seaport terminals: AN integrated Approach and application .

[23] pondman, . Donald ,(2011),intermodal transport:porp transition management.

[24] Charles , (2010) , doctorat de I universite de Toulou se, improving the desing and management of agile supply chains : feed back and application in the context of humanitarian aid .

[25] chen, yi- lin, (2009),Analysis of the agile de ployment, article from an internet database.

[26] mahfoua, Amr, (Dublin institute of technology),(2009), Seaport management aspects and perspective: AN Over view . article from an internet database.

[27] Hallgnen, matias ,(2009), Lean and agile mamufucturing: external and internal drivers and performance outcomes, article from an internet database.

[28] jafarnejad, ,Ahmad, shahaie, Behman ,(2008),Evaluation and improving organizational agility .
[29] Nancy Alexopoulou . el at (2008), A Holistic Approach for enterprise agility .
[30] Andreeva, Natalia ,(2008), Lean prodaction and agilie manufacturing new systems of doing business in the 21 S T Century .
[31] karwowski, waldemar, k. Layer, John, (2007), A review of enterprise agility: concepts, frame works , and attributes, Bohdana sherehiy.
[32] solomenikovs, Andrejs ,(2006),Transport and telecommunication institute, doctord thesis.
[33] A.Ganasekaran, E. Tir tiroglu,v. wolsten croft, (2002),Agile manufacturing:a taxonomy of strategic and technological,
[34] A.Gunasekaran and y.y.yusuf, (2002), Agile manufacturing: a taxonomy of strategic and Technological, article from an internet database.
[35] Sharifi, z. zhang. (1999),A methodology for achieving agility in manufacturing organizations, article from an internet database.
[36] Naylor, Ben, Naim, Mohamed , Berry Danny,(1999), Leangility: intergrating the lean and total supply chain., article from an internet database.
[37] Beskovnik, Bojan and twrdy .(2011). Agile port and intermodle transport operations model to secure lean supply chains concept. Promet-traffic and transportation , vol .23 ,2011, no .105-112.
[38] united nations conference on trade and development (unctad)(2013). Review of maritime transport ,united nations , new York and Geneva ,2013.
[39] international bank for reconstruction and development ,the world bank , trade logistics in the global economy (the logistics performance index and its indicators ,(2013).
[40] international bank for reconstruction and development ,the world bank , trade logistics in the global economy (the logistics performance index and its indicators ,(2014).