

## **The impact of different leadership styles in successful implementation of knowledge management in organizations by structural equation modeling**

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### **Abstract**

In an era that in which the economy is in the core of knowledge aspect, knowledge is considered as a vital factor in maintaining the sustained competitive advantage of organizations. Today, the art and skill of management in organizations is moving towards changing into the art of "knowledge management"; and, leadership means providing suitable conditions and grounds in producing valuable knowledge via human force thought, and performing this task in a way that would encourage individuals in undertaking personal responsibility. The leadership factor plays a key role in successful implementation of knowledge management in enterprises and organizations; thus, in the present research, the authors have studied the relationship between knowledge management and leadership style as well as defining empowerment leadership style in knowledge management. The statistical population considered in this research consists of employees of Iran Export Credit Insurance Institute. The present research is applied in term of goal and description and correlation in terms of nature and methodology adoption. To study the relationship between variables, the regression analysis based on SPSS software, factorial analysis, modeling structural equations based on variance by using PLS software has been used. In line with research hypotheses, the correlation coefficients showed the positive and significant relationship between transformational and transactional leadership with knowledge management; and on Laissez-Faire leadership style, no significant relationship was confirmed between this variable and knowledge management variable. Ultimately, transactional leadership style was recognized as empowerment leadership style in knowledge management at this institute.

**Keywords:** Knowledge management, knowledge leadership, transformational leadership, structural equation modeling, Laissez-Faire leadership.

### **1- Introduction**

In present conditions of the world, it is not strange for concepts such as knowledge management to appear as one of the most popular viewpoints of strategic change management of the twenty-first century's first year. Knowledge serves as a strategic source for a modern organization; which should

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be created for the purpose of survival and maintaining competitiveness advantage (Hung et al., 2010). Draker (1993) introduced knowledge, alongside capital and workforce, as the only significant economic source in knowledge communities. Therefore, focus on knowledge and knowledge management is the basic need of organizations. Those organizations which have been successful in knowledge management incline to paying attention to knowledge as an asset and develop organizational values and norms that support knowledge creation and sharing (Keran et al., 2013). Knowledge is a key source in achieving sustainable competitiveness advantage. In response to intensive competitive environments, many organizations have turned into better use and management of knowledge in their organization to achieve business success. (Wu, 2012). Knowledge management facilitates maintenance and distribution of knowledge in an enterprise in achieving competitiveness advantage. In another word, knowledge is an extensive concept which indicates the entire processes via which the enterprise expands knowledge. Those processes include: business, keeping and saving, distributing, sharing and applying knowledge in an organization (Keran et al., 2012). Knowledge management does not emerge and roots in an organization all by itself. Implementing knowledge management plans requires effective leadership and administration of knowledge at all organizational levels. In an organization in which the concept of knowledge leadership has been already realized, knowledge is discussed as a strategic source in the organization; and in order to manage this valuable source, a strategic plan has been developed based on the vision and management of knowledge organization (Abtahi & Salavati, 2006). Leadership is one of the essential necessities for performing many activities in current organizations and at the same time, it plays a key role in the success of knowledge management; for, leaders serve as a model whose behaviors are models for knowledge management (Wong, 2005). In addition, among other leadership capabilities which are important, there are other aspects such as orders for changes in work, persuading the employees in understanding the importance of knowledge, helping in maintaining their attitudes and creating a culture which facilitates knowledge creation and sharing (Lingbo & Kaichao, 2012). In many organizations, neglecting this important dimension poses an essential issue in performing the activities related to knowledge management that lead to reducing the efficiency of those actions. Despite the fact that selecting suitable leadership style could serve as a factor in empowering knowledge management, ignoring this subject and lack of compatibility of leadership style in the organization with vital principles of knowledge management can pose as a barrier in the successful implementation of knowledge management. Therefore; one of the basic issues in today enterprises, including Export Guarantee Fund of Iran, is to define and determine a leadership style that would be the inconsistency with the basic frameworks of knowledge management. If this is realized, the efficiency of knowledge management in the organization will show a significant improvement. Thus, the main question in this research is which leadership style is more effective in improving knowledge management process at Exports Credit Insurance Institute of Iran?

## **2- Literature review**

The two factors discussed in this research are leadership styles and knowledge management and the models which are used in each subject are as follows:

### **2-1- Leadership styles**

There are various models of leadership styles. The present research has adopted the Multifactor Leadership Model based on researcher's studies and owing to the fact that the model is more recent. Bass (1985) presented the multifactor model on Transformational, Transactional and Laissez Faire; a model which expressed leader's behavior based on the five dimensions of transformational leadership, two dimensions of transactional leadership and one dimension of Laissez-Faire leadership.

### **2-2- Knowledge management**

More than twenty models have been already introduced on knowledge management implementation. These models consist of two to eight stages and they are almost similar in context; although, they have terms and phrases in the different arrangement. In the present model, knowledge management milestone model has been selected due to higher comprehensively and considering

placement of internal and peripheral dimensions of the organization. Human and role of human in design and implementation of knowledge management concept.

Among the theorists of the first group, one may note Mohotra (1998), Naison (2000), Swan (1999), Davenport & Prosak (1998) who mostly defined knowledge management as an information technology that could include cases such as information banks, video- conferences, computer programs, internet and etc.

Theorists that have showed more attention to the effect of role and presence of man, and human capital concept in the organization as well as knowledge management are researchers such as Manasko (1999), Petrush (2001), Nonaka (1995) and Martinson (2000) who believed man to be the main core of implementing knowledge management system and considered information technology as knowledge management system support.

### 2-3- Ran Johnston model

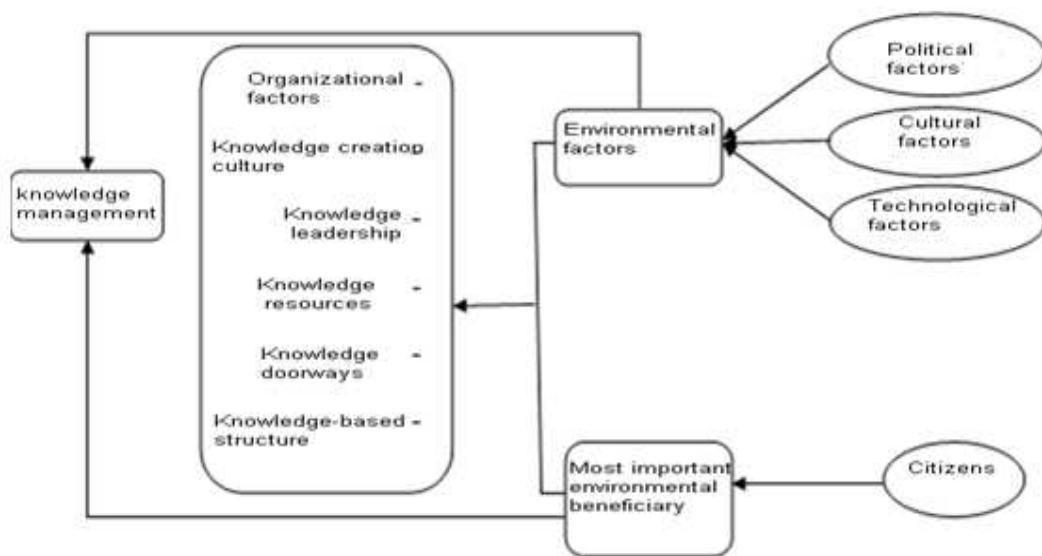
This model knows applying knowledge management practices due to considering two factors of work complexity amount and required interaction amount to do that work. This model divides the available activities in the organization into four categories that their features are listed in table 1.

**Table 1.** The knowledge management model according to work structure (Jahnston, 2006)

		<b>Group</b>
Fourth category: Works with high complexity which requires high interaction	First category: Works with low complexity which requires high interaction	
Third category: Works with high complexity which requires low interaction Judgmental - non-routine	Second category: Works with low complexity which requires low interaction Routine	<b>Individual</b>

### 2-4- Applying the model of knowledge management in Iran governmental organizations

This analytical model is formulated in four levels. The first level of analytical model claims that organizational factors have a direct effect on knowledge management. At the second level of analysis, this claim has been suggested that the citizens influence on knowledge management through influencing organizational factors. Also on the third level, it is claimed that environmental factors through influencing organizational factors influence on knowledge management in Iran governmental organizations. Finally, on the fourth level, the influence of various factors on knowledge management in Iran governmental organizations has been portrayed (Abtahi and Salavati, 2006).



**Fig 1.** The proposed model of Abtahi and Salavati (2006) for applying the model of knowledge management in Iran governmental organizations

In the following, a brief overview of the models offered in different years in the field of knowledge management is provided in table 2.

**Table 2.** Different models of knowledge management

Model	Scholar	Elements and model processes (compiled by Scholar)
Spiral model of knowledge	Nonaka (1994 )	Study interoperability between explicit and tacit knowledge simultaneous with their development in the level of ontology- Expand organizational knowledge at individual level with the help of developing functional forum
Knowledge transfer model	Nonaka& Takeuchi (1995)	Knowledge transfer processes: <ul style="list-style-type: none"> <li>- Socialization (tacit to tacit): transfer tacit knowledge from one person to another</li> <li>- Externalization (explicit to explicit): conversion of tacit knowledge to explicit, such as seminars</li> <li>- Combine (explicit to explicit) move from individual explicit knowledge to group explicit knowledge</li> <li>- Internalization (explicit to tacit): institutionalizing collective explicit knowledge obtained in the organization</li> </ul>
Organizational Knowledge Management Model	Andersen & APQC (1996)	Processes: create, identify, collect, capture, organization, application, and sharing in addition to enabling framework: leadership, culture, technology, measurement
Knowledge Cycle Model	Meyer& Zack (1996)	Steps: acquisition, refining, storage/retrieval, distribution, and display /they looked at deployment of them in this cycle as knowledge refinery
Framework of knowledge management steps	Venderspek & spijkervet (1997 )	Processes: conceptualization, reflection, action, and review with the impact of internal and external development
Process-based models and knowledge management providers	O'dell & Grayson (1998)	Process: Create and identify, collect, organization, distribute, adaptation and applying knowledge providers: leadership, culture, technology, measurement and knowledge measurement
Eight process model of knowledge	Beckman (1999)	Processes: identify, capture, select, distribute, using, creating and trading
Knowledge value chain model	Lee & Yang (2000)	Processes: acquisition and innovation, support, integration, and distribution knowledge infrastructure: the relationship between the customer and the supplier, knowledge storage capacity, recruitment high educated people and senior management.
Four-dimensional model	Tannembaum & Alligar (2000)	Dimensions: knowledge sharing, access to knowledge, integrate knowledge, application of knowledge
Stage model of implementation knowledge management	Lee & Kim (2001)	Processes: Innovation, replication, integration, and networking
Knowledge Life Cycle	Shaw & Sheehan (2002)	Knowledge along with the curve progress during the four stages. Creation, preparation, publication, commercialization

Table 3 presents a list of definitions of different researchers on knowledge management.

**Table 3. Different definitions of knowledge management**

<b>Researchers</b>	<b>Year</b>	<b>Definition of knowledge management (collected by author)</b>
Liebeskind	1996	A system for administration, collection, correction, and prorogation of knowledge in all its form in an organization
Beckman	1997	Structures for achieving specialty, knowledge, and experience which provide new capabilities; cause better performance, encourages innovation and increases beneficiaries' desirable values.
Malhotra	1998	Knowledge management includes organizational processes which pursue a combination of synergy in data and information processes, information technology and creativity and innovative powers of individuals.
Chait	1999	It is a multi-dimensional process which needs the effective and simultaneous management of four dimensions: contents, culture, process, infrastructure
Barron	2000	It is a systemic and interrelated approach to the identification, management and sharing the intangible assets of an institute. This approach covers assets such as information and databases, documents, policies and developed models.
Hales	2001	A process through which, the organization finds the ability to transform data into information and information to knowledge; in addition, it will be able to effectively use the acquired knowledge in its decisions.
Wig	2002	Establishing necessary processes for identifying and absorbing data, information, and knowledge needed by the organization from internal and external environments, transporting them to the organization and individuals' decisions and actions.
Shankar	2003	Knowledge management is the process of identification and utilization of knowledge assets of the organization for transferring the business advantages to customers or organization.
Gupta	2004	A series of processes that govern the creation, prorogation and benefitting from knowledge.
Sabherwal	2005	A series of actions needed to achieve the source of the required knowledge.
Sousa & Hendrikes	2006	Knowledge management studies policies, strategies, and techniques for proving the organization's proof through optimizing the necessary conditions to improve efficiency, innovation, and partnership among employees.
Jolley & Therih	2007	Knowledge management depends on this thought that employees should process a knowledge that could lead to the excellent performance of the organization.
Fernandez	2008	Knowledge management notes on identifying and using collective knowledge in an organization to contribute to the organization.
King	2009	Knowledge management includes planning, organizing, individuals' motivation and control, processes and systems in the organization to ensure the knowledge assets increase and is used effectively.
Liao & Wu	2010	Knowledge is used in the companies as the main source of competitive advantage. Therefore, the ability of knowledge management focuses on the knowledge management processes which develops and uses knowledge in the organization.
Carlos et al.	2011	The process of creativity, collection, organizing, prorogation, and application of knowledge of creating value from intangible assets in the organization
Keran	2013	Processes that transform information and mental assets into durable values.

In continuation, a summary of models introduced on knowledge management during different years, is presented on table 4.

**Table 4.** Different models of Knowledge Management

<b>Model</b>	<b>Author</b>	<b>Elements and processes of the model (author collected)</b>
Frid knowledge management model for government	Frid (2003)	In five subsequent levels: 1. Knowledge chaotic: Understanding and implementation of goals, visions and knowledge management indicators 2. Knowledge aware: Employing and protecting goals and visions of Departmental Knowledge Management 3. Focus on knowledge: Starting focus on new activities 4. Knowledge management: Institutionalizing actions and evaluation of intellectual assets
Knowledge management evaluation model	Oztemel & Aslankaya (2004)	Strategic level: Strategy of knowledge- Knowledge culture Technical level: Knowledge planning- Knowledge infrastructure Operational level: Supervision and improvement of knowledge
Higher Learning Institution (HLI)	Abdullah et al (2005)	Elements: Knowledge management strategies, human resources, cultural ground, organizational construct, processes (recognition, organization, knowledge achievement, sharing knowledge, protecting knowledge base, knowledge developmental activities, information technology, leadership, knowledge management assessment, taking models
Hierarchical and five-layer model of knowledge management	Hicks et al. (2006)	Layer one: Individuals, all memories available in human minds Layer two: Facts, preparation of raw data for higher levels via documents, database and data banks Layer three: Effects, helping in decision-making process, by using tools such as decision making support systems, learning systems, group devices and reports Layer four: Solutions, decision making, and implementation by using intelligent systems and functional standards (the best actions) Layer five: Innovation, via re-engineering and presenting knowledge-core goods and services
Knowledge management stage model	Lin (2007)	Stage 1, Activities: Company's learning about the importance of knowledge and preparation for knowledge management actions Stage 2, development: Company's investment on knowledge management infrastructure for the purpose of facilitation and motivation of knowledge activities Stage 3: Maturity: Establishment of knowledge network for inter-organizational and extra organizational members
Knowledge evolution process model in industrial clusters	Wang & Shen (2008)	1. Concentration of knowledge elements 2. Establishing communication networks of knowledge elements 3. Absorbing knowledge from environment, culture, codes, traditions, and individuals knowledge acquisition for improving innovation and evolution
Knowledge value chain model	Almarabeh (2009)	Primary activities: Sharing information, integrity of information, knowledge activities Supportive activities: Knowledge Acquisition, Knowledge Transformation, Confidentiality and Knowledge Dissemination
The Model of Socio-Technical Knowledge Management	Sajeva (2010)	<ul style="list-style-type: none"> <li>• Technical dimensions: Information-communication technologies</li> <li>• Social dimensions: Strategic leadership, organizational infrastructure, organizational learning, organizational culture</li> <li>• Processes: Knowledge recognition, knowledge acquisition, knowledge creation, knowledge saving, knowledge dissemination, knowledge application</li> </ul>

These three dimensions have the counter relationship.

Based on the researches carried out on internal and external resources recently, one may note the following remarks: A research titled "Model of Disciplinary Knowledge Management at the Disciplinary Forces of the Islamic Republic of Iran" was carried out by Mohammadi Moghaddam (2011). The research results indicated relationship between Organizational Technology, Knowledge Management Processes, and Knowledge Management Style; in a way that: repetitive and routine occupations are in conformity and consistency with knowledge internalization and passive knowledge management style; the non-repetitive jobs, with externalization of knowledge and dynamic knowledge management style, the arts and skills jobs with knowledge socialization and humanistic knowledge management style; and engineering jobs have the coordination and conformity to knowledge combination and systemic knowledge management style.

Hamid Ostadi Jafari (2012) in a research titled: Prioritization of key factors in success of knowledge management system implementation by aiming at prioritization of key hardware and software factors of success in knowledge management system through McKenzie Consultants Seven S Model; it was

concluded the relationship between age and service years with knowledge management process is not significant; however, the relationship with knowledge management processes stages is significant. A research was carried out by Zohdolsalam et al. (2011), titled "Activities of Knowledge Management and Organizational Effectiveness by using empirical evidence in Bangladesh". This research focused on the relationship between knowledge management actions in the template of acquired strategy, transformation, application, and support on one hand; the organizational effectiveness on the other hand in underdeveloped countries such as Bangladesh. Different knowledge management models were tested and analyzed by using scientific texts of knowledge management. The general results of the research indicated the activities of knowledge management have a significant influence on organizational effectiveness.

A research was carried out by Wu (2012) on classifying vital factors in the success of knowledge management implementation. He classified those factors by using Decision Making Trial and Evaluation Laboratory (DEMATEL) method which is based on graph theory. The general results of the research showed that those factors in term of priority include: culture and individual, support of senior managers, communications, incentives, information technology, honesty, time, criteria of evaluation of function and security.

Sung et al. (2012) carried out a research titled "Effect of Transformational Leadership and Procedural Justice on Organizational Citizenship Behavior in Commercial Environment". The general results of the research indicated the positive effect of transformational leadership on organizational citizenship behavior; and at the same time, he showed that transformational leadership plays the role of an intermediate variable in the relationship between organizational justice and organizational citizenship behavior.

Another paper was published by Chuang et al. (2013) titled "Role of Leadership, Management of Human Resources and Implied Knowledge in the Management of Knowledge-base Groups" on 162 research and development (R&D) group. The goal of the research was to study the role of human resources system and leadership style on an acquisition and sharing knowledge in R&D teams. The results of the research showed the significant relationship between human resources system by knowledge acquisition and share; in addition, empowerment leadership has positive effects on this relationship as a modifier factor.

With respect to the theoretical framework of research and the literature review, our two main variables in this research are leadership style and knowledge management; and, the goal of this research is to study the relationship between these variables and the constituent categories; thus, by considering the research goal, the research questions are as follows:

- **Main question of this research**

What is the relationship between leadership style and the activities of knowledge management at Exports Credit Insurance Institute of Iran?

- **The main hypothesis of this research**

There is the relationship between leadership style and the activities of knowledge management at Exports Credit Insurance Institute of Iran.

- **Secondary hypothesis of this research**

With respect to the main hypothesis of the research, the secondary hypotheses of research are as follows:

- **Secondary hypothesis number one**

There is a significant relationship between transformational leadership style and knowledge management activities at Exports Credit Insurance Institute of Iran.

- **Secondary hypothesis number two**

There is a significant relationship between transactional leadership style and knowledge management activities at Exports Credit Insurance Institute of Iran.

- **Third sub-hypothesis**

There is a significant relationship between Laissez-faire leadership style and knowledge management practices in Export Guarantee Fund of Iran.

- **Fourth sub-hypothesis**

Transformational leadership style based on Bass leadership model has the most influence on knowledge management practices in Export Guarantee Fund of Iran.

### **3- Models and methodology**

In the present research, to evaluate leadership styles, the multifactorial leadership questionnaire (MLO) has been used. This questionnaire has been developed by Bass and Avolio and contains 36 questions (options). The questionnaire has been already edited several times and the present research has used its second edition of 2000. On knowledge management ground too, the author-developed questionnaire is used based on the milestone model variables of knowledge management.

The Statistical Package for the Social Sciences (SPSS) and Partial Least Square (PLS) statistics software will be used for analysis and interpretation of results, model validity measurement, and hypothesis study.

- Descriptive statistics for analyzing demographic data
- Kolmogorov – Smirnov test for studying normality of data
- Cronbach Alfa and Spearman-Brown tests for measuring the reliability

The simple and multivariable regression method will be used to study the relationship between variables. In addition, for the simultaneous study of the relation between the variables, the structural equation modeling (SEM) model is used. As the size of the population is 110 persons, the volume of the sample, based on Morgan sampling method was assessed to be 86 persons.

#### **3-1- Suggested model of the research**

In the present research, in order to present the suggested model of the research, after studies carried out on different theories and models related to main variables of the research on knowledge management, the knowledge management milestone model was selected due to its comprehensibility than other knowledge management models; and discussing the internal and external factors of the organization; and, on leadership styles, after studying the path of leadership schools, ultimately, Bass and Avolio model was selected due to being more recent and including important dimensions of leadership style.

And finally, it was selected based on the studies conducted on the criteria that constitute knowledge management based on the mentioned model which include determining the knowledge goals, identification and acquiring knowledge, development and sharing knowledge, maintaining and using knowledge, assessment, and feedback; and Bass and Avolio leadership model, which is based on the three leadership style of transformational, transactional and Laisse Fair styles.

The categories that constitute transformational leadership style include:

- Ideal behavior
- Ideal characteristics
- Inspiring motivation
- Personal concerns
- Mental encouragement

The constitutes that form transactional leadership include:

- Conditional reward
- Management based on active exception
- Management based on passive exception
- Research validity and reliability



The viewpoint of a number of professors and experts was used to measure the content validity which indicates to what extent the indicators measure the different aspects of a concept; and the factorial analysis was used to measure the construct validity which addresses the degree of relationship of indicators with the theoretical aspects and anticipations; and its relevant dimensions in this research. In addition, the convergent validity of the research was measured by Partial Least Squares (PLS) software, which led to assessing it is desirable and acceptable level. The general reliability of the questionnaire (leadership questionnaire and knowledge management questionnaire) was first measured by Cronbach Alpha. In measuring the reliability of the questions by Cronbach's alpha, the internal consistency or inner stability of the statements is measured. The Alpha coefficient ranges between 0 to 1; as Alpha goes higher, the reliability of the scale will be higher. Of course, most researchers in social sciences in which, the researcher aims at studying the amount of correlation of the two variables, an Alpha value higher than 0.7 is desirable and acceptable (Ghiasvand, 2011). In this paper, Alpha coefficient and number of options are equal to 0.945 and 56, respectively.

In addition to this value, the reliability of each one of the questionnaire dimension was measured separately via PLS software. For this purpose, the value of Cronbach's Alpha and the combined reliability coefficient of each one of the dimensions were measured separately. According to the following table, the value of Chronbach's Alpha related to transformation and transactional leadership dimension was obtained to be 0.9278 and 0.692; respectively, which indicates very high reliability and creditability. In addition, on knowledge management; too, the value of Chronbach's Alpha was obtained to be equal to 0.9535; which is in desirable level. Since Cronbach's Alpha is used for measuring the inner integrity of indicators of each dimension, we need minimum two indicators in each dimension in order to be able to calculate. Therefore, Cronbach's Alpha is not applicable in Laissez-Faire leadership which has one indicator. Cronbach alpha on the unobserved variables of the model are represented on tables 5.

**Table 5.** Cronbach alpha on the unobserved variables of the model

Cronbach Alpha	Dimensions
Transformation leadership	0.9278
Transactional leadership	0.692
Laisse Fair Leadership	1
Knowledge management	0.9535

The value of composite reliability coefficient is another factor which is usable in assessing the inner consistency reliability of the model. The value of this coefficient; too, varies from 0 to 1; the value higher than 0.7 is more acceptable and values less than 0.6 was assessed undesirable. This coefficient was assessed to be 0.94533 for transformational leadership, 0.8635 for transactional leadership and 0.9642 for knowledge management. The value of composite reliability for unobserved variables with one indicator; such as Laissez-Faire leadership is equal to 1. The values of this coefficient are presented briefly in table 6.

**Table 6.** Composite Reliability (CR) related to unobserved variables of the model

CR	Dimensions
Transformational leadership	0.9453
Transactional leadership	0.8635
Knowledge management	0.9642

### 3-2- The analytical model of the research

The following table shows the general construct of the questionnaire and division of the number of statements related to each indicator. A brief definition has been used on the terms used in this table for more transparency. Construct means a concept which is adapted to describe the phenomena subject of study.

Dimension means a concept which is used for analyzing a distinguished aspect of the constructed subject of study.

Measures, indicators, items (which are considered an indicator in this research) are quantitative values which are acquired or measurable through observation, interviews or other available tools.

Indicators are in two forms of observable or unobservable (concealed). The observable indicators are measurable by one measure while unobserved indicators are not directly observable or measurable, rather, they are inferred through observable variables (Hanafizadeh & Zare, 2012).

**Table 7.** Analytical model of the research

<b>Structures subject of study</b>	<b>Dimensions and multi-indicators of concerned variables</b>	<b>Number of options in the questionnaire</b>	<b>Total questions</b>	
leadership	Transformational leadership	Personal concerns	15-19-29-31	4
		Inspiring motivation	9-13-26-36	4
		Ideological characteristics	10-18-21-25	4
		Ideological ideas	6-14-23-34	4
		Mental persuasion	2-8-30-32	4
	Transactional leadership	Conditional rewards	1-11-16-35	4
		Exception-based management (active)	4-22-24-27	4
		Exception based management (passive)	3-12-17-20	4
	Laissez-Faire leadership	5-7-28-33	4	
	Total questions related to leadership (MLQ questionnaires)			36
Knowledge management	Knowledge leadership (dimension subject of study)	role of leadership in determining knowledge goals	39-52-53	4
		Role of leadership in identification and acquisition of knowledge	38-40-42-49-55-56	6
		Role of leadership in knowledge development and sharing	37-41-43	5
		Role of leadership in maintaining and using knowledge	44-45-46-50-51	3
		role of leadership in evaluation and feedback	47-48-54	3
		Total questions on knowledge management		
	Total questions of the questionnaire			56

### 3-3- Data analysis method

The Statistical Package for the Social Sciences (SPSS) and Partial Least Squares (PLS) statistical software will be used for analyzing and interpreting the results, measuring the validity of the model and studying the hypothesis.

- Descriptive statistics for analyzing demographic data
- The Kolmogorov- Smirnov test for studying the normality of data
- The Cronbach's Alpha and Spearman-Brown tests for measuring the reliability
- The convergence validity coefficient (AVE) for measuring the validity
- The multivariable regression model to study the relationship between the variables
- To rank the effects of independent variables, the Beta coefficient obtained from regression analysis is used

In addition, to study the relationship between the variables at the same time, the Variance-Based Structural Equation Modeling (VBSEM) or Partial Least Square (PLS) is used. In discussing Structural Equation Modeling (SEM) and modeling relationship between unobservable variances (variance that could not be observed directly and are measured via observable indicators); two different approaches are discussed, which include the covariance-based SEM and variance-based analysis, or analyzing path analysis based on PLS (Azar, Gholamzadeh & Ghanavati, 2012).

- To measure the significance of the relationship, the t statistic resulted from bootstrapping capability of PLS software
- For factorial analysis of the model variables, the factorial loads and the path coefficients resulting from PLS software;
- And, for measuring the quality of the model, the determining coefficient (R2) obtained from this software is used

### 3-4- Statistical analysis of the main hypothesis of research

- The multi-regression analysis was used to study the mentioned hypothesis, and since the effects of variables that constitute the leadership style and knowledge management; the tables of which are presented in the appendix. The main hypothesis of the research is presented as follows:
- There is a significant relationship between leadership style and knowledge management actions at Iran Exports Credit Insurance Institute

The hypotheses are presented as follows:

**Hypothesis H0:** There is no significant relationship between leadership style and knowledge management actions at Iran Exports Credit Insurance Institute.

**Hypothesis H1:** There is a significant relationship between leadership style and knowledge management actions at Iran Exports Credit Insurance Institute.

If the significance value related to the leadership style and knowledge management is less than 0.05, hypothesis H0 is rejected. The results from the relevant data are presented in table 8.

**Table 8.** Results of regression analysis on main hypothesis one

Hypothesis	Main
Predicting variable	Leadership style
Criteria variable	Knowledge management
Multi-correlation coefficient	R=0.641
Determining coefficient	R2=0.411
Modified determining coefficient	R2.adj=0.403
Unilateral variance analysis	ANOVA=54.362
Statistic T	7.373
Significance level	0.00
Study results	confirmation

Since the significance value of regression equation of leadership style and knowledge management was obtained to be less than 0.05, the statistics hypothesis H0 is rejected in 0.05 error level and hypothesis H1 is acceptable. In another word, the leadership style has positive and significance with the effectiveness of knowledge management. The determining coefficient in this analysis is 0.411 which indicate around 41 percent of changes in the knowledge management action at Iran Exports Credit Insurance Institute is affected by changes in leadership style; in another word, it reveals the relatively strong effect of leadership style on the effectiveness of knowledge management activities. The modified determining coefficient (R2.adj) in this analysis was equal to 0.403; this coefficient shows modified correlation square; and the relation to R2 is more real; for, it does not necessarily increase by increase in the number of independent variables, while, the value of R2 is a function of the number of the independent variables of the model. The ANOVA table shows the significance test of determining coefficient. In fact, when we attempt to know whether or not the determined coefficient which was obtained is statistically significant, we use variance analysis test. Based on this,

the value of F is equal to the proportion of average regression variance to average remained variance, which is equal to 54.362, and the significance level is Sig=0.00; thus, the independent variables of the research could define the changes independent variables fairly well.

### 3-5- Statistical analysis of first secondary hypothesis of research

“There is a significant relationship between transformational leadership style and knowledge management actions at Iran Exports Credits Insurance Institute.”

The statistical hypotheses of the first secondary hypothesis of the research are as follows:

**Hypothesis H0:** There is no significant relationship between transformational leadership style and knowledge management actions at Iran Exports Credit Insurance Institute.”

**Hypothesis H1:** There is the significant relationship between transformational leadership style and knowledge management actions at Iran Exports Credit Insurance Institute.”

The results of regression analysis of this hypothesis are presented in Table 9.

**Table 9.** Results of regression analysis of secondary hypothesis one

Hypothesis	Secondary one
Predicting variable	Transformational leadership style
Criteria variable	Knowledge management
Multi-correlation coefficient	R=0.549
Determining coefficient	R <sup>2</sup> =0.301
Modified determining coefficient	R <sup>2</sup> .adj=0.292
Unilateral variance analysis	ANOVA=33.602
Statistic T	5.797
Significance level	0.00
Study results	confirmation

As the correlation coefficient between the two variables of transformational leadership and knowledge management is positive and the significance indicator is less than 0.05, the statistical hypothesis H0 can be rejected at 0.05 error level. In another word, it can be stated there is a positive and significant relationship between transformational leadership style and knowledge management; and, as in this analysis, the determining coefficient is 0.301, it can be concluded that almost 30 percent of changes in knowledge management variable is affected by transformational leadership.

### 3-6- Statistical analysis of second secondary hypothesis of research

“There is a significant relationship between transactional leadership style and knowledge management actions at Iran Exports Credits Insurance Institute.”

The statistical hypotheses of the first secondary hypothesis of the research are as follows:

**Hypothesis H0:** There is no significant relationship between transactional leadership style and knowledge management actions at Iran Exports Credit Insurance Institute.

**Hypothesis H1:** There is the significant relationship between transactional leadership style and knowledge management actions at Iran Exports Credit Insurance Institute.

The results of regression analysis of this hypothesis are presented in Table 10.

**Table 10.** Results of regression analysis of secondary hypothesis two

Hypothesis	Secondary two
Predicting variable	Transactional leadership style
Criteria variable	Knowledge management
Multi-correlation coefficient	R=0.694
Determining coefficient	R <sup>2</sup> =0.482
Modified determining coefficient	R <sup>2</sup> .adj=0.475
Unilateral variance analysis	ANOVA=72.579
Statistic T	8.519
Significance level	0.00
Study results	confirmation

As the correlation coefficient between the two variables of transactional leadership and knowledge management is positive and the significance indicator is less than 0.05, the statistical hypothesis H0 can be rejected at 0.05 error level. In short, it can be stated there is a positive and significant relationship between transactional leadership style and knowledge management; and, as in this analysis, the determining coefficient is 0.482, it can be concluded that almost 48 percent of changes in knowledge management variable is affected by transactional leadership.

### 3-7- Statistical analysis of third sub-hypothesis

There is a significant relationship between Laissez-faire leadership style and knowledge management practices in Export Guarantee Fund of Iran.

Hypotheses related to it are discussed as follows:

**Hypothesis H0:** There is not any significant relationship between Laissez-faire leadership style and knowledge management practices in Export Guarantee Fund of Iran.

**Hypothesis H1:** There is a significant relationship between Laissez-faire leadership style and knowledge management practices in Export Guarantee Fund of Iran.

Results of the analysis are presented in Table 11:

<b>Third sub</b>	<b>Hypothesis</b>
Laissez-faire leadership style	Predictor variables
Knowledge management	Criterion variable
R= 0.444	Multiple correlation coefficients
R <sup>2</sup> = 0.197	Determination coefficient
R <sup>2</sup> .adj= 0.187	Adjusted determination coefficient
ANOVA= 19.176	One-way variance analysis
-4.379	T Statistic
0.00	Significance level
Rejected	Results of study

Regarding that T statistic is negative; the significant relationship between Laissez-faire leadership style and knowledge management practices in Export Guarantee Fund of Iran is not confirmed and third sub-hypothesis is rejected.

### 3-8- Statistical analysis of forth sub-hypothesis

Transformational leadership style has the most influence on knowledge management practices in Export Guarantee Fund of Iran.

According to regression analysis results presented in the appendix and its main components are summarized in Table 12, evaluate the hypothesis is as follows:

**Table 12.** The regression analysis test coefficients about the influence of leadership styles on knowledge management

<b>Sig</b>	<b>T</b>	<b>Beta</b>	<b>b</b>	<b>Independent variables</b>
0.004	2.982	0.232	0.267	Transformational leadership style
0.000	5.915	0.510	0.691	Transactional leadership style
0.014	-2.512	-0.2	-0.176	Laissez-faire leadership style

Beta coefficient indicates the Standardized impact value of independent variables and the results of analysis show that among the three leadership style of bass model, transactional leadership style with beta coefficient equal to 0.510 has the most positive effect on knowledge management in Export Guarantee Fund of Iran and after that transformational leadership style with beta coefficient of 0.232 has the second level in terms of influencing on knowledge management practices in the mentioned organization; therefore the results of fourth sub-hypothesis is rejected.

### 3-9- Factorial analysis of the research model variables

As mentioned before, the PLS software was used to confirm and study the variables of the model and the constituent indicators; and to present the final model of the research on the relationship between leadership styles and knowledge management. As shown in figure 2, the values on the measurement model communications (the relationship of indicators and dimensions) reveal the factorial load and the present values on the communication of structural model (the relationship between dimensions) indicate the path coefficients.

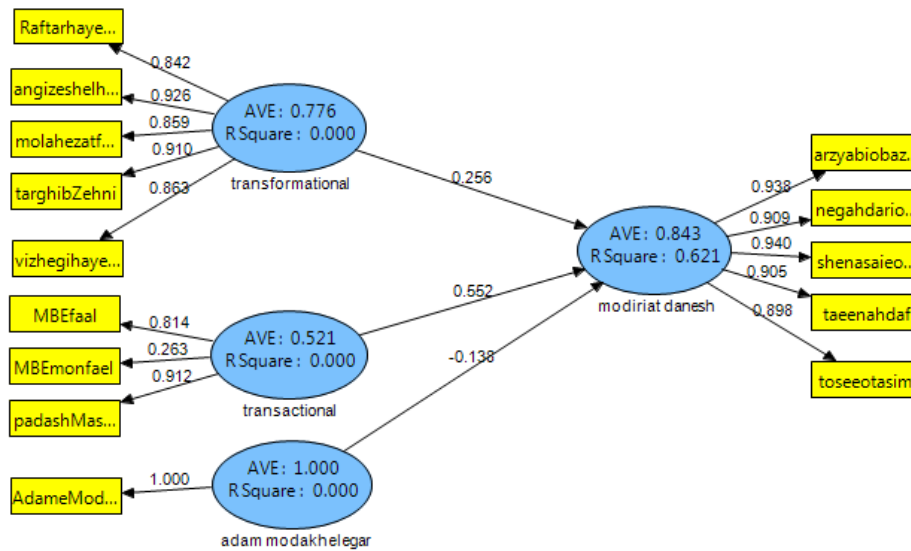


Fig 2. Factorial charges and coefficients of variables paths, and indicators that constitute the model

The value of factorial load shall be larger than 0.6; the value of factorial load lower than 0.4 are considered small and must be eliminated from the set of indicators. With respect to the results of the analysis, the factorial load of indexes that constitute knowledge management; namely, determining the knowledge goals, recognition and acquisition of knowledge, development and sharing knowledge, maintaining and using knowledge, and evaluation and feedback yield the values of 0.905, 0.94, 0.898, 0.909 and 0.938; all being higher than minimum acceptable range; i.e. 0.4; therefore, the role of the all five factors as constituent factors of knowledge management was confirmed (figure 3).

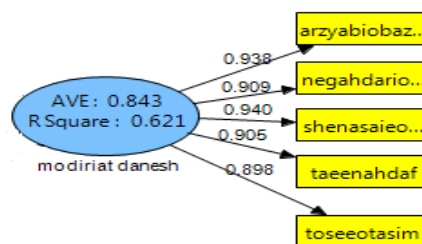
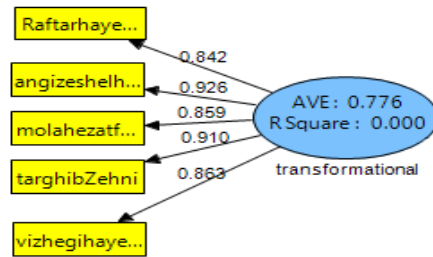


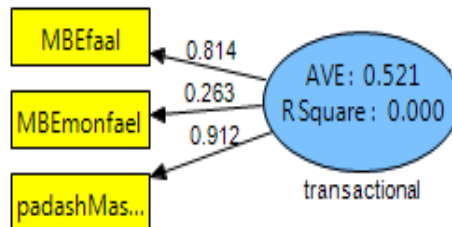
Fig 3. Knowledge management variable (Factorial charge related to indicators)

The indexes that constitute transformational leadership include ideal behaviors, ideal characteristics, inspiring motivation, mental encouragement and personal concerns. As the factorial load of these indexes is 0.842, 0.863, 0.926, 0.91 and 0.859; respectively, therefore, these variables could be known as indicators that constitute transformational leadership dimension (figure 4).



**Fig 4.** Transformational leadership (Factorial charge on variables indicators)

With respect to the literature subject of the research, the variables of conditional rewards, management based on active exception and management based on passive exceptions have been introduced as the constituents of transactional leadership dimensions. The results of the analysis showed the factorial loads of those indexes were 0.912, 0.814 and 0.263; respectively. As mentioned before, since the factorial load of conditional reward; and, management based on active exception variables were higher than minimum value acceptable; i.e. 0.4, therefore, these two variables are confirmed as indicators constituting transactional leadership; however, on management based on passive exception, since the factorial load of this variable is less than minimum value acceptable; this variable is thus eliminated from the model (figure 5).



**Fig 5.** Transactional leadership (Factorial charge related to the variable indicators)

The path coefficients obtained via PLS analysis confirm the analysis based on SPSS software, indicating the subject that transactional leadership has the highest positive effect on knowledge management actions, and transformational leadership is in second place after the transactional leadership in terms of effects on knowledge management. Therefore, the secondary hypothesis four is rejected; hence, among the three leadership styles described in the model; transactional leadership style can be introduced as the knowledge management empowerment leadership style in this organization. The results are shown in figure 6.

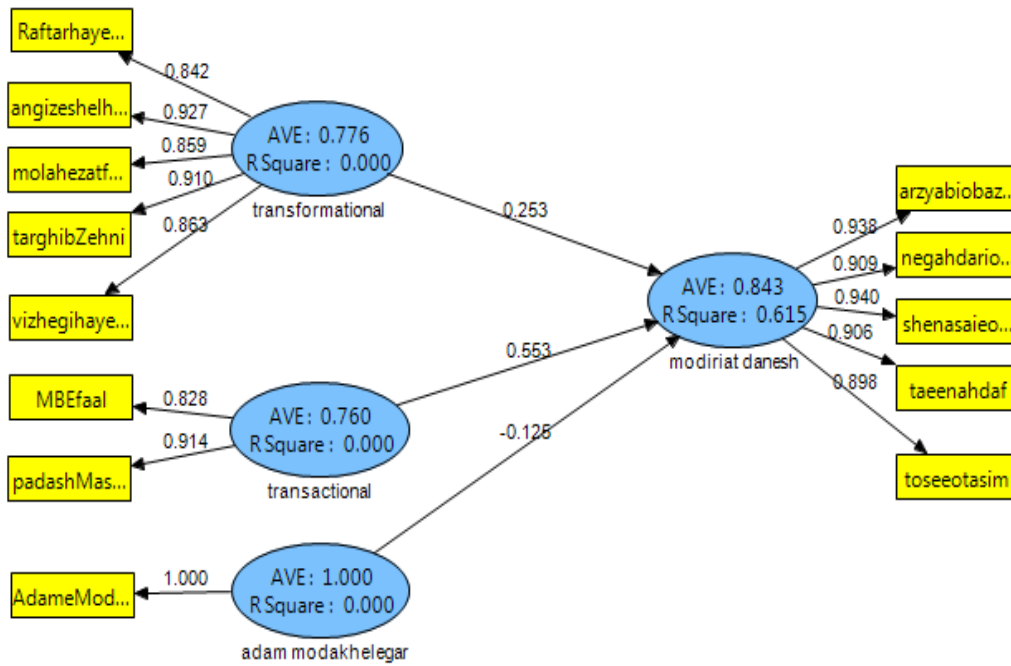


Fig 6. Factorial charge and coefficients of final model path based on construct equations

### 3-10- Determining coefficient (R<sup>2</sup>)

The coefficient for determining the relationship between the values of average variance extracted measures an unobserved variable with its total variance value. The value of R<sup>2</sup> is equal to 0.67, 0.33 and 0.19 in PLS path models are described as desirable, fair and poor; respectively. As shown in Fig 6, the value of R<sup>2</sup> is equal to 0.615, showing the desirable quality of the model. In addition, it should be mentioned that the value of R<sup>2</sup> does not express for independent unobserved variables (leadership styles).

The general results of analyzing the research hypothesis are shown in table 13.

Table 13. Results of hypothesis

Number	Hypotheses	Results
Main	"There is the significant relationship between leadership style and knowledge management actions at Iran Exports Credits Insurance Institute."	Confirmed
Secondary one	"There is the significant relationship between transformational leadership style and knowledge management actions at Iran Exports Credits Insurance Institute."	Confirmed
Secondary two	"There is the significant relationship between transactional leadership style and knowledge management actions at Iran Exports Credits Insurance Institute."	Confirmed
Third sub	There is a significant relationship between Laissez-faire leadership style and knowledge management practices in Export Guarantee Fund of Iran.	Rejected
Fourth sub	Transformational leadership style based on Bass leadership model has the most influence on knowledge management practices in Export Guarantee Fund of Iran.	Rejected

## 4- Conclusion

In this research, the knowledge management model consisted of two inner and external cycles and one complementary cycle. The inner cycle included knowledge recognition, knowledge acquisition, knowledge development, knowledge sharing and transacting, using knowledge and maintaining knowledge. The outer cycle included: determining the knowledge goals, evaluating the knowledge and the supplementary cycle which included the feedback. Based on the literature review and studies performed and for the purpose of clarification in developing a questionnaire with the composition of supplementary and dimensions close to each other, the entire dimensions of this model was presented in the template of five general sets as follows. The factorial load of those indexes was measured via modeling structural equations and the quality of the model was assessed accordingly. With respect to high factorial load and closeness of indexes that constituted the knowledge management dimension,



the high importance of all five indexes could be perceived. However, classification of indexes in the order of largeness of their factorial loads is as follows:

The index of knowledge recognition and acquisition had highest factorial load among knowledge management indexes; showing that, in order to have a successful implementation of knowledge management, it is necessary to pay attention to knowledge recognition and acquisition; and, in the first step, the organization must know what it knows and what knowledge and information is available in the organization. This knowledge detection must be performed simultaneously both on inner and outside resources. After determining knowledge gap, the organization shall work on providing and acquiring the necessary knowledge from local and foreign markets, such as customers, competitors, colleagues and other sources which have been determined in the identification/recognition stage. The evaluation and feedback indicator had also shown high factorial load which in turn emphasizes the importance of considering the results as a feedback in correcting and determining the goals of the concerned organization. Attention to this index saves the organization from wasting its resources, doing parallel and repeated work and increases efficiency.

After the two indexes mentioned above, the knowledge maintenance and application indicator took the second rank. It can be concluded from this result that ensuring useful application of knowledge in the organization and employing suitable methods and procedure for saving, maintaining and updating knowledge is of high importance in implementing knowledge management in the mentioned organization.

In addition, the high factorial load of the index on determining knowledge goal confirms the necessity of determining and setting knowledge goals in both strategic and operational levels; revealing the importance of creating a knowledge culture in the organization and designing suitable plans for implementing each dimension of knowledge management. The knowledge development and sharing/transaction too, with respect to high factorial load was confirmed as one of the main indexes in knowledge management in the mentioned organization which in turn, emphasizes on the importance of establishing new skills, better ideas, more efficient processes and knowledge transfer from personal knowledge to group and organizational knowledge. In short, all five indexes of knowledge management employed in this research were approved and confirmed as indicators that constitute knowledge management, owing to their high factorial load value.

Bass multifactorial leadership model was used in leadership style. This model consists of three main dimensions of transformational, transactional and Laissez-Faire leadership style. The transformational leadership style includes the five main indicators, all of which (indicators) were confirmed based on their high factorial load. These indicators as per their factorial load include: inspiring motivation, mental encouragement, ideal characteristics, personal concerns and ideal behaviors; which address the importance of activities such as optimistic talks about future, talking with agility and enthusiasm on the work which shall be performed in future, emphasize on the importance of futuristic view, and spreading the sense of hope on achieving the goals on transformational leadership style. The transformational leadership dimension; too, constitutes of three indexes, conditional reward indicator had the highest factorial load. In addition, the management indicator based on active exception; too, was approved as one of the important indicators of transactional leadership dimension; however, the management index based on passive exception was not accepted due to having a factorial load lower than acceptable limit and was eliminated in the final model based on structural equation; thus, one may conclude that emergence of behaviors such as interfering in the affairs after making the issues in mistake direction, and merely in the critical cases; and believing in the idea of "do not mend what is not broken could not have an effective role in executing the transactional leadership in this organization. The third dimension was Laissez-Faire leadership which was measured in the template of four questions; where, the factorial load of the questions was high and was assessed acceptable.

With respect to the above-mentioned subjects, following suggestions are offered:

- With respect to the confirmation of the strong relationship between leadership style and knowledge management, organizations should show special attention to the leadership dimension when implementing knowledge management
- Employing transactional leadership for more successful implementation of knowledge management at Iran Exports Credits Insurance Institute

- To reinforce the knowledge leadership dimensions in this organization, helping the subordinates must be done proportion to their efforts
- Specifying individuals who are suitable to achieve significant goals could be effective in reinforcing the knowledge leadership dimensions in this organization

In future researchers too, followings could be addressed:

With respect to the expansion of the leadership theories and styles, in future researchers, one can study other leadership styles that are effective in knowledge management.

- The present research did not have any specific focus to the type of organization in terms of being public or private; therefore, comparative study of leadership styles effective on knowledge management in public and private organizations could be used in future researchers
- The present research has studied the relationship between leadership success and knowledge management regardless to the medium and modifier variables; therefore, in future researchers, the medium and modifying variables which might affect this relationship could be studied
- In future analysis too, followings could be studied: Since each organization should employ a suitable leadership style proportion to the active human forces in it, it is, therefore, possible to perform this research in other organizations and statistical population as well

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## Appendix:

For the Third sub hypothesis  
**Regression**

**Table A.1.** Variables Entered/Removed

Mode 1	Variables Entered	Variables Removed	Method
1	AdameModak helegar <sup>b</sup>	.	Enter

a. Dependent Variable: modiriatdanesh  
b. All requested variables entered.

**Table A.2.** Model Summary

Mode 1	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.444 <sup>a</sup>	.197	.187	.74542

a. Predictors: (Constant), AdameModakhelegar

**Table A.3.** ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.655	1	10.655	19.176	.000 <sup>b</sup>
	Residual	43.340	78	.556		
	Total	53.995	79			

a. Dependent Variable: modiriatdanesh  
b. Predictors: (Constant), AdameModakhelegar

**Table A.4.** Coefficients<sup>a</sup>

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	4.168	.300		13.891	.000
	AdameModakhelegar	-.390	.089	-.444	-4.379	.000

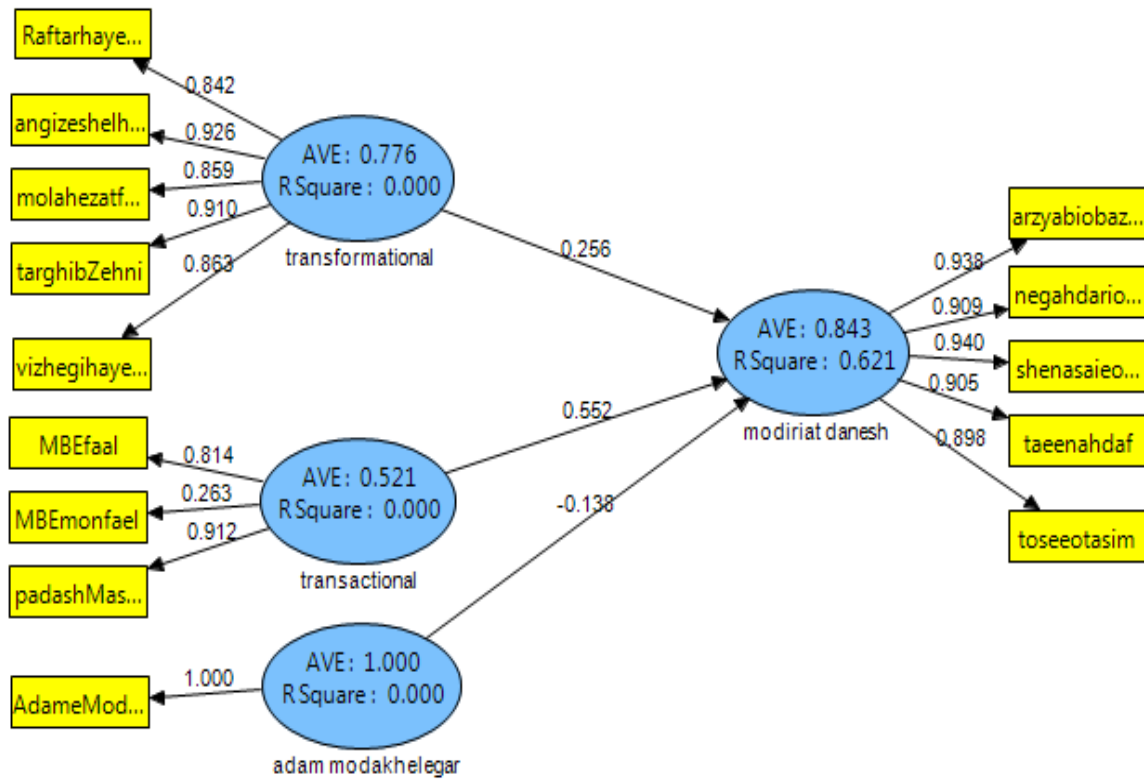
a. Dependent Variable: modiriatdanesh

**Table A.5.** Cronbach's Alpha

	AVE	Composite Reliability	R Square	Cronbach's Alpha	Commonality	Redundancy
adam modakhelegar	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000
modiriat danesh	0.8434	0.9642	0.6153	0.9535	0.8434	0.0804
transactional	0.7603	0.8635	0.0000	0.6920	0.7603	0.0000
transformational	0.7758	0.9453	0.0000	0.9278	0.7758	0.0000

**Table A.6.** T Statistics

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (STERR)	T Statistics ( O/STERR )
adam modakhelegar -> modiriat danesh	-0.1250	-0.1099	0.0710	0.0710	1.7625
transactional -> modiriat danesh	0.5529	0.5598	0.0650	0.0650	8.5017
transformational -> modiriat danesh	0.2530	0.2540	0.0785	0.0785	3.2233



**Fig A.1.** The results of structural equation modeling on the final GPA