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Research Article

The Role of Intellectual Capital (IC) on Survival or Decline of Organizations: A Case Study of EN Bank

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Abstract: This study aimed to evaluate the role of Intellectual Capital (IC) on organizations' performance in banking industry. Target population of this study was selected from branches of EN bank in Tehran. Sampling method followed the simple random approach and the data were collected by using a questionnaire. The sample included 227 managers of the EN Bank in Tehran province. Factor (construct) validity in description of this study was done. This research discussed the intellectual capital's main components such as 3 aspect of human, structural and client capital and their impact on organizational performance. For hypotheses testing and confirmative factor analysis, path analysis software of LISREL was employed. Research findings demonstrate that however, in branches of EN Bank in Tehran province, there are strong mutual relationships between the components of intellectual capitals (human capital, structural and client capital) but these capitals and the relationships between them are not related to organizational performance.

Keywords: Client capital, human capital, Intellectual Capital (IC), LISREL organizational performance, path analysis, structural capital

INTRODUCTION

By emerging knowledge economy, knowledge has become more prominent in comparison with other production factors such as land, capital and machine, in such a way that in this economy, knowledge is considered as the most important factor in addition to a significant competitive advantage of organizations (Seetharaman *et al*., 2002). One the features of knowledge is its intangibility, abstraction and insensibility and its valuation and measurement is very difficult; while previously by using accounting methods, organizations were able to calculate the value and measure of their production factors perfectly, today accounting methods do not have the required effectiveness (Sullivan and Sullivan, 2000). In knowledge economy, success of organizations depends on their abilities to manage these intangible assets and in order to be able to manage these assets, first one should detect and measure and finally manage them (Sanchez *et al*., 2000). Generally, organizational assets can be divided into 2 general categories:

- **Tangible assets:** These assets include financial and physical assets that are reflected almost perfectly in the organizations' balance sheets. These assets operate under the principles of the economy of scarcity; that is more using of them will result in the reduction of their value.
- **Intangible assets:** These assets also can be divided into 2 general categories:
  - **Intellectual property:** Intangible assets that are identified and supported by law and are known as intellectual property. Intellectual property includes patents, copyrights, deductibles and trademarks that some of them are reflected in balance sheet.
  - **Intellectual capital:** Includes those intangible assets that are not supported by law and operate under the principles of the economy of abundance; that is more using of them will not result in the reduction of their values and usually they are not reflected in balance sheet (Tayles *et al*., 2002).

By the development of knowledge economy or the economy of knowledge, it was observed that organizations' intangible asset, in comparison with other tangible assets, is significantly more important factor in maintenance and fulfillment of stable competitive advantages (Tayles *et al*., 2002). Until before 1980, industries structure and generally the

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trading environment had been the most important determinative factors for understanding organizations' competitive advantage and organizations were paying attention to their organizational environment, rather than to the inside of the organization. In those days, the role of management was to find ways and methods that combine goods and markets with each other and organizations were relied on environmental resources that were mainly tangible. Nevertheless, after 1980, another determinative factor was introduced and it was the way of using inimitable, non-transferable, scarce and durable resources that were valuable to clients. The organizations' competitive advantage was based on these resources. These mainly intangible resources and assets were specifically human and were located inside the organization. This made organizations while considering organizational outside environment, paying special attention to the inside of organizations and intellectual capitals. Now the organizations' focus is on the inside resources and features of the company, which cannot be found in the environment. These resources are introduced by various names such as organizational memory, intangible resources, strategic assets, core capabilities and competencies and unobservable assets and knowledge assets, etc. By organizations more focusing on defining these resources, it was obvious that these assets are more knowledge based and can include everything such as client's devotion and technology skills or inside goodwill (Sanchez *et al*., 2000). According to the above propositions, companies not only need to identify measure and manage their intangible assets, but also should try always to improve these assets continuously. Organizations that are unable to improve their knowledge assets continuously, will exchange their survival with their destruction (Bontis, 1998). This study will review the different dimensions of intellectual capital including interrelationship between structural, human and client capital, in addition to impact of these factors on organizational performance of EN bank.

LITERATURE REVIEW

Definitions of intellectual capital: Intellectual capital includes all of the processes and assets that normally and traditionally are not shown in the balance sheet and also includes those intangible assets such as trademarks, marks and patents that modern accounting methods consider them Roos and Roos (1997). Roos *et al*. (1997) believe that intellectual capital is the sum of the knowledge of the members of an organization and is the conversion of practical usage of the knowledge of the members of an organization. In addition, it is stated that intellectual capital is an inclusive set of tangible and intangible resources of the company (Petty and Guthrie, 2000); additionally, intellectual capital refers to the revolution of these tangible and intangible resources (Gupta and Roos, 2001). Intellectual capital is elusive, but when it is detected and used, it can enable the organization to compete with a new resource in the environment (Bontis, 1996).

Various classifications of intellectual capital components: Until now, many models are offered in the field of classifying the components of intellectual capital. In the following, these classifications and components will be elaborately discussed. However, it should be mentioned that still there is not a comprehensive classification for the components of intellectual capital among various definitions.

For example, Bontis (1998) mentioned to 3 kinds of client, structural and human capital, but in 2000 changed his classification to human capital, structural capital, relational capital and intellectual property or asset. By human capital, he means the level of personal knowledge that organization's employees have and usually is implicit. Structural capital means all of the inhuman assets or organizational capabilities that are used for responding to the necessities of market. Relational capital refers to all of the knowledge in the relations of an organization with its environment that includes clients, merchandisers, scientific communities, etc., that the most important component of a relational capital is client capital, because success of organization depends on its client capital. Intellectual property refers to that part of intangible assets that are supported and indentified by law, such as copyright and patent (Bontis, 1998; Bontis *et al*., 2000). According to Bontis, among these intellectual capitals, human capital is very significant as it is the resource of innovation, reformation and strategic renewal. This capital can be resulted from a revolutionary intellectual meeting or an imagining in the office or removing old files by employees or through the improvement of personal skill etc. Besides, Bontis mentioned that there are series of mutual relations among the components of intellectual capitals, in such a way that even if one organization has appropriate human capital, but not appropriate structural capital, it cannot use of the knowledge of its individuals and as a result, it cannot respond properly to its client capital (Bontis *et al*., 2000). Roos *et al*. (1997) also divide intellectual capital into three human capital including competency, attitude and intellectual agility and structural capital including all of the structures and processes and organizational intellectual property and cultural assets and relational capital including relations with inside and outside beneficiaries of a company.

However, later Roos added another component to his classification in the name of renewal and development capital, which this later capital includes new patents and educational efforts (Bontis *et al*., 2000).

Brooking in his classification refers to human-centered assets, infrastructural assets and intellectual property and market assets. Human-centered assets mean skills, capabilities and problem solving expertise and leadership styles; infrastructural assets mean all of the technologies, processes and methodologies that enable an organization to do activities; intellectual property means patent and trademarks and technical knowledge; and market assets mean brand, clients, clients' devotion and distributing channels (Bontis *et al*., 2000). Sveiby (1997) has offered his classification as the inner structure, outer structure and employees' competencies. This classification is known as intangible asset monitor classification. Employees' competencies are the proposed human capital in the previous classifications and inner structure means structural or organizational capital and outer structure refers to relational or client capital. It is obvious that these models at least include the following cases:

- Official and unofficial knowledge and experience of individuals
- Organizational systems and processes
- Technology and innovation
- Business relations such as relations with clients, merchandisers and strategic associates (Vander Meer-Kooistra and Zijlstra, 2001)

Investigating the literature of intellectual capital indicates that most of the intellectual capital models have tried to consider three main components with a set of common features for intellectual capital (Bontis *et al*., 2000; Stewart, 1997). These components include human aspect, relational aspect and organizational aspect.

Human aspect: Human capital is one of the most important and namely the most important kind of intellectual or knowledge assets in organization, because these assets are the sources of creativity that are in the individuals of an organization as implied knowledge and is one of the crucial factors affecting the performance of any organization. However, it should be considered that the existence of these knowledge assets alone is not sufficient for the fulfillment of the performance of a company. The purpose of companies should be the conversion of these assets in the form of plain knowledge for all of the levels of organization; otherwise, the existence and creation of any organizational value would be impossible. Human capital is an accumulative combination of professional and general knowledge of employees and leadership capabilities and problem solving capabilities and taking risks that the evaluation of this kind of capital by these components is very difficult. This kind of capital in a company improves the operational creativity of tangible assets (equipments and tools) and activates intangible assets. Accordingly, in successful companies there are many investments for employees to increase and improve the attitude and capabilities and experiences for competition in today changing environment (Bozbura, 2004). It should be added that the property of this kind of capital is not in the authority of companies and exit of individuals from the organization will result in losing organizational memory that is considered a threat for the organization (Bontis *et al*., 2000).

Relational aspect (client capital): Relational capital is the set of all of the assets that manage and organize the relations of the company with environment and this capital includes the relation of the company with clients, shareholders, merchandizers, competitors, government, governmental institutions and society. Although the most important part of relational capital is client relations, one should not consider just these relations. In fact, relational capital is the prestige and reflection of the company in the environment. Measurement of relational capital is related to this issue that how environment understands the company. Relational capital includes trademarks and client devotion scales and company's popularity and merchandisers and client feedback systems, etc., (Bozbura, 2004).

Organizational aspect (structural capital): Organizational aspect in intellectual capital is defined as the organizational (structural) capital. Organizational capital is defined as the set of assets that allow the organization's creativity ability. Mission of the company, perspective, fundamental values and strategies and job systems and inner processes of a company can be regarded as this kind of assets. Organizational capital is one of the underlying principles for the creation of learner organizations. Even if the employees of an organization have high and sufficient abilities and capabilities, if the organization's structure is composed of a series of weak rules and systems, one cannot use of these capabilities and talents of employees for the creation of values and having a good organizational performance. Moreover, if the organization invests much on technology, but employees don't have the ability to use this technology, this investment and accordingly organizational capital will be not useful and effective (Bontis, 1998). Finally, this point should be added that these 3 capitals with

each other could effect on the performance of the organization. Therefore, the existence of relations between them is very important, thus organizations should not think of the improvement of these capitals separately. Accordingly, it is necessary that these assets be measured in the organizations and their existence situation be defined to think for their improvement and development. In addition, studies have shown that there should be a mutual and appropriate relation between these three assets. Marr *et al*. (2003a) in an article called "why organizations measure their intellectual capitals?" descriptively mentions the reasons for measuring the intellectual capital. By investigating the literature of intellectual capital, they have stated five basic reasons for this issue that why the following dimensions were used to measure the intellectual capital:

- Helping organizations for regulating their strategy
- Evaluating the implementation of strategies
- Helping the decisions related to the development and variety
- Using the results of intellectual capital measurement as a basis for compensation of services
- Serving the related criteria to intellectual capital to foreign shareholders and beneficiaries

The most basic attitudes toward intellectual capital measurement are:

- Human resource accounting
- Economic value added
- Balanced scorecard
- Intellectual capital (Bontis *et al*., 1999)
- The ratio of Tobin proposed by Tobin, winner of Nobel award, in which intellectual capital is the ratio of market value to office value
- Technology Broker model proposed by Brooking
- Competency strategic management model proposed by Bueno
- Observer of intangible assets proposed by Sveiby (1997)

Most of these intellectual capital measurement models are offered in the section of intellectual capital reporting, too (Ordo´n˜ez de Pablos, 2003).

According to Roos *et al*. (1997) and Marr *et al*. (2003b), intellectual capital management includes the following cases:

- Identifying key intellectual capital that causes the fulfillment of strategic performance of a company.

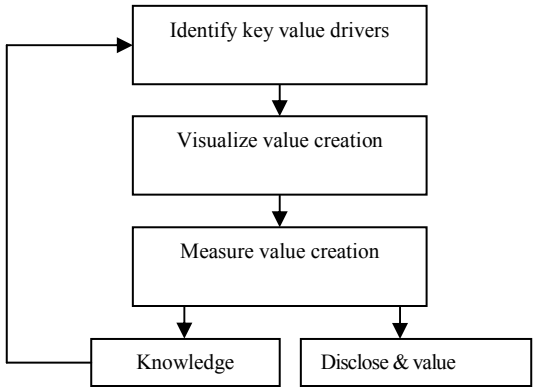

Fig. 1: Intellectual capital management Marr *et al*. (2003b)

- Manifestation and showing of value creation pathways and transformations of key intellectual capital
- Measuring performance, specially its dynamic revolutions
- Cultivating key intellectual capital by using knowledge management processes
- Inner and outer reporting of performance (Marr *et al*., 2003a)

Steps related to intellectual capital management are shown in Fig. 1.

Organizational performance: Performance is the result (output) of organization in doing activities during a certain time span (Ho and Zhu, 2004). Performance is imputed to the way of doing duties and activities and their results. Performance management is a process that treats of defining and evaluation and measurement, valuation and judgment about performance during a certain time span and the improvement of this performance. There is a specific index for evaluating the performance and the expected standard limit of performance. It should be noted that performance evaluation is performed in 3 levels of individual, unit and organization (Sanchez *et al*., 2000). Principal components and steps of conducting performance management model involved in three principal components:

Performance planning: Includes determination of performance goals in different organizational levels, identifying the required activities along achievement of the expected results and doing appropriate organization.

Performance measurement: A process that evaluates the development rate toward obtaining the determined goals and includes the information related to the effectiveness of resources transformed to outputs

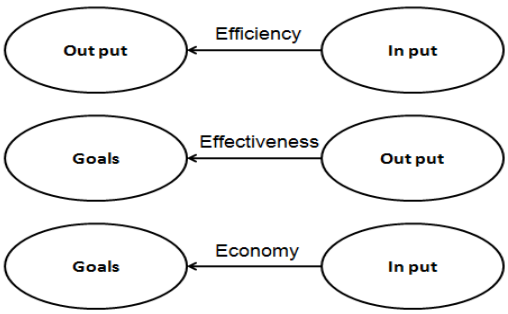

Fig. 2: Performance evaluations' levels Sanchez *et al*. (2000)

(goods and services), the quality of these outputs and the results.

Performance improvement: A set of one or more activities or concordant projects that has corrective or preventive aspects (Sanchez *et al*., 2000). Performance has 3 key concepts as the following:

Input: set of resources and facility that are used by organizations. The principal resource of each organization is its human resources. Expenses, capitals, technologies, chances and authorities, etc., can also be human resources that necessarily are not based on money and one cannot state them based on money.

Output: It is the set of the results of the activities of operational sections of the organization. It is the different forms of productions and volume of operational duties performed by the organization, etc. its results. Outputs can also not be based on money or maybe one cannot state them based on money.

Objective: The purpose of an organization is its existence philosophy that the organization is based in order to achieve it. Relations between inputs and outputs and goals of the organization are defined by the concepts of effectiveness and impression and being economic. Figure 2 shows these relations.

What is performance evaluation? Performance evaluation is the process of quantifying effectiveness and impression of the organization. In addition, performance evaluation can be defined as continuous surveillance and reporting about the results of the plan and the rate of achieving to the goals of the organization (Neely *et al*., 1995). Figure 2 shows the relation between inputs, outputs and goals of the organization with the concepts of effectiveness and impression and being economic. Performance evaluation of operational domain of the organization is the enjoyment measurement of this domain that is known by the term of effectiveness. Performance evaluation of strategic domain of the organization means where the policy-making is done is the size of enjoyment of this domain that is known by the term of impression. Finally, performance evaluation of all of the organization is the enjoyment measurement that is known by the term of being economic. Relations between the concepts of effectiveness and impression and being economic with the concept of performance evaluation are given in Fig. 3.

There are various scales for performance measurement, especially performance in government section (Arthur and Huntley, 2005; Andrews *et al*., 2006). One of the prevalent methods for assessing the effectiveness of governmental and private organizations, with homogeneous units (units that have identical inputs and outputs), is the method of data envelopment analysis (Charnes *et al*., 1990). In recent decade, this method has many applications in banking and financial and health and treatment and other sections (Ramanathan, 2007). Evidence indicates that there are many relations between knowledge management and intellectual capital and organizational performance (Dupouet and Yildizoglu, 2006). Intellectual capital with the reduction of expenses, increase of interests obtained from exchange with client has made a value and increase the organizational performance (Youndt and Snell, 2004).

Conceptual model of the study: As various aspects from various viewpoints had been offered, Bontis model (human capital-structural capital-client capital) has been used for assessing the intellectual capital. In addition, various aspects have been offered about organizational performance that in this study organizational performance refers to effectiveness; that is assessing the organization's performance in the field of operation that is done through data envelopment analysis. In addition, in the field of this intellectual capital way of effecting on organizational performance, the model of mutual relations between intellectual capitals' components and direct effects of these intellectual capitals on organizational performance has been used. Accordingly, the conceptual model of the study is stated in Fig. 4.

Hypotheses:

- There is a significant and positive relationship between structural capital and organizational performance in EN Bank.

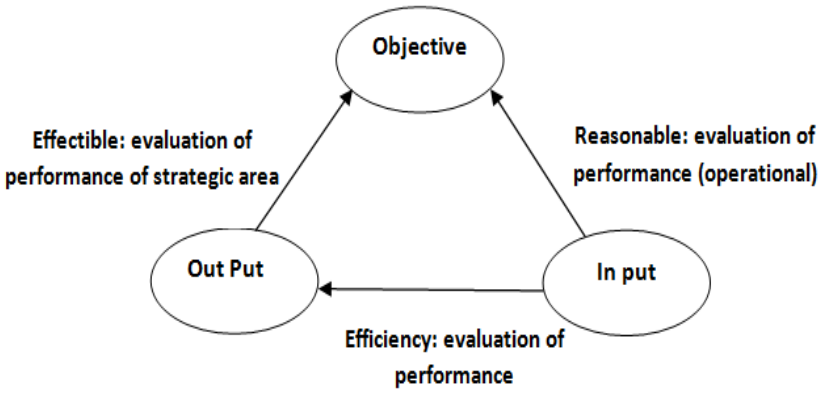

Fig. 3: Effectiveness and performance evaluation Sanchez *et al*. (2000)

- There is a significant and positive relationship between human capital and organizational performance in EN Bank.
- There is a significant and positive relationship between client capital and organizational performance in EN Bank.
- There is a significant relationship between human capital and structural capital in EN Bank.
- There is a significant relationship between structural capital and client capital in EN Bank.

There is a significant relationship between human capital and client capital in EN Bank.

METHODOLOGY

As the purpose of the study is to determine mutual relationships between intellectual capital components and their effect on organizational performance, regarding operational goal and regarding the way of gathering descriptive information, it is of conjugation type and clearly based on structural equation model. In the analytic model of the study, human capital and structural capital and client capital variables have been considered as independent variables and organizational performance has been considered as a dependent variable. The basic mean of gathering information is questionnaire that according to these survived variables are formulated with 51 questions with five options that 19 questions relate to human capital, 16 questions relate to structural capital and 16 questions relate to client capital. In order to assess the stability of questionnaire, a pilot test composing of 54 questionnaires was done. Subsequently, by using the obtained data from these questionnaires, the rate of confidence coefficient was calculated by Cronbach Alpha method. In this case, all of intellectual capital questions (all of the three clients

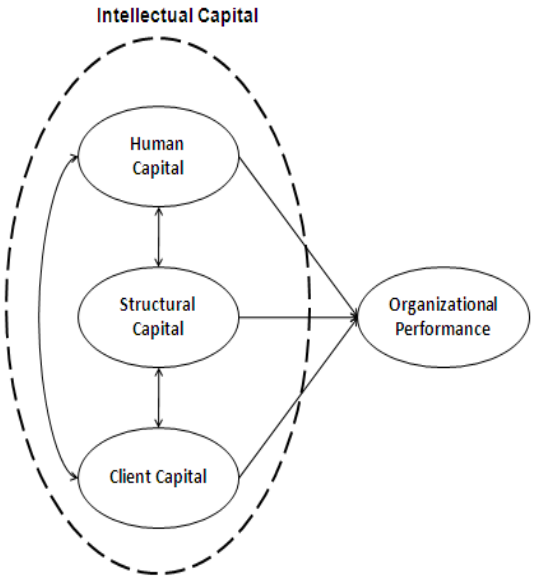

Fig. 4: Conceptual model of the study

and structural and human capital) number 0.93 was obtained and for anyone of client and structural and human capitals, the numbers of 0.75 and 0.79 and 0.87 were obtained respectively. These numbers indicate that the used questionnaire has the capacity of confidence or in other words has the required stability. In order to assess the validity of questions, factor validity has been used. Factor validity is a kind of construct validity that is obtained by factor analysis. Factor analysis is a statistical technique that has many applications in human science. In fact, using factor analysis in branches in which tests and questionnaires are used is necessary. In this study at first 51 questions were provided for three general factors of human capital, structural capital and client capital. Then in first-order

Table 1: The results of first-order factor analysis

Name of field	Name of the obtained factors	Represented variance (%)
Human	Improvement systems, employees' performance and competence and satisfaction	70
Structural	Systems and structures, teamwork, improvement and renewal, improvement of the process	68
Client	Market orientation, clients' governance, clients' devotion, client orientation	70

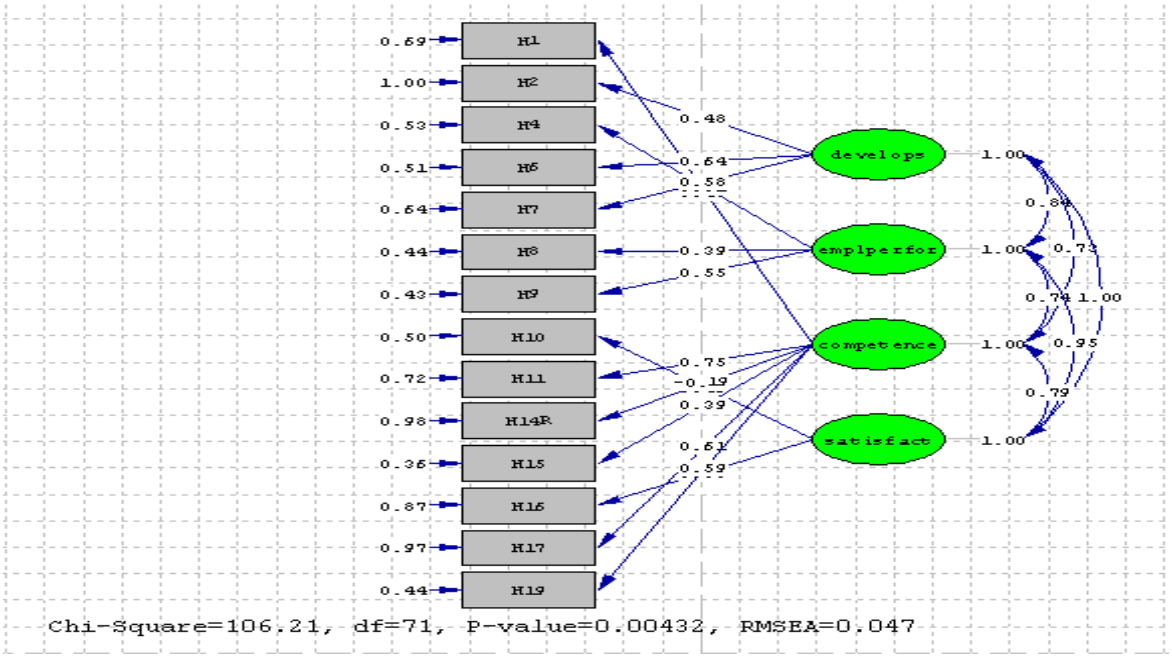

Fig. 5: Human capital measurement model by using the confirmed factor analysis

factor analysis, it was tried to obtain the primitive factors of these capitals (which are more than 10 factors) and then by using second-order factor analysis this factor will be converted into three general factors of human capital and structural capital and client capital finally. The results of first-order factor analysis of three fields by using principal components analysis method and Varimax rotation method with normalization are given in Table 1.

Subjects: Subjects of this study are all of the EN Bank managers in Tehran province. As in this study the desired subjects, which are the branches of EN Bank in Tehran province with EN Bank managers, are limited, so in order to calculate the required sample volume for the survey, the following equation has been used. In this study, as the number of subjects is known and the chance of bank branches is equal for selection, thus simple random sampling method has been used. The subjects are 227:

$$n = \frac{Nz^2_{\alpha/2}pq}{\varepsilon^2(N-1)+z^2_{\alpha/2}pq} \Rightarrow n = 227$$

Data analysis: Before testing the hypotheses, it is necessary to assure of the accuracy of the measured models of human and structural and client capitals. Thus in the following, measurement models of these 3 capitals are presented respectively that this job is done by structural equation model.

Human capital measurement model by using the confirmed factor analysis: According to LISREL output, the value of the calculated χ^2 is 106.21. Low χ^2 indicates the appropriate feeding of the model. According to the following results that are obtained from LISREL software output, the less value of χ^2, the more appropriate model is the offered model.

χ^2 = 106.21, df = 71, RMSEA = 0.047, GFA = 0.94, AGFA = 0.91

By considering the results of the LISREL output of nonstandard estimation section of the model it is obvious that human capital measurement model is an appropriate model because its Chi-square value and its RMSEA value are low and its GFI value and AGFI value are above 90% (Fig. 5).

According to LISREL output, the value of the calculated χ^2 is 163.33. Low χ^2 indicates the appropriate feeding of the model. According to the following

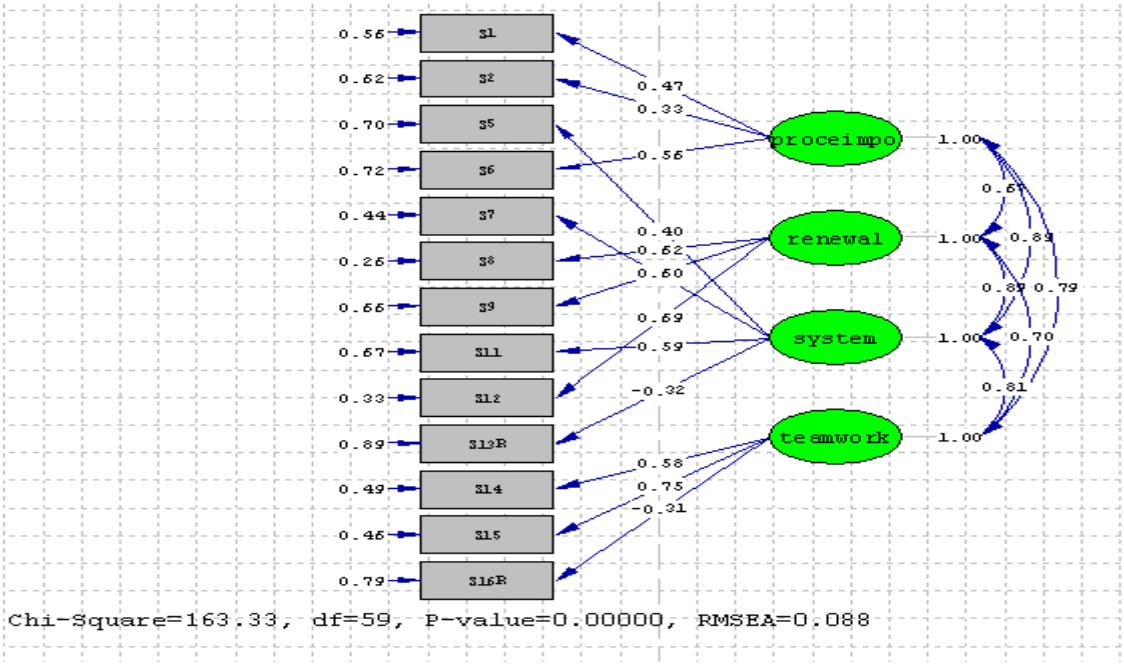

Fig. 6: Structural capital measurement model by using the confirmed factor analysis

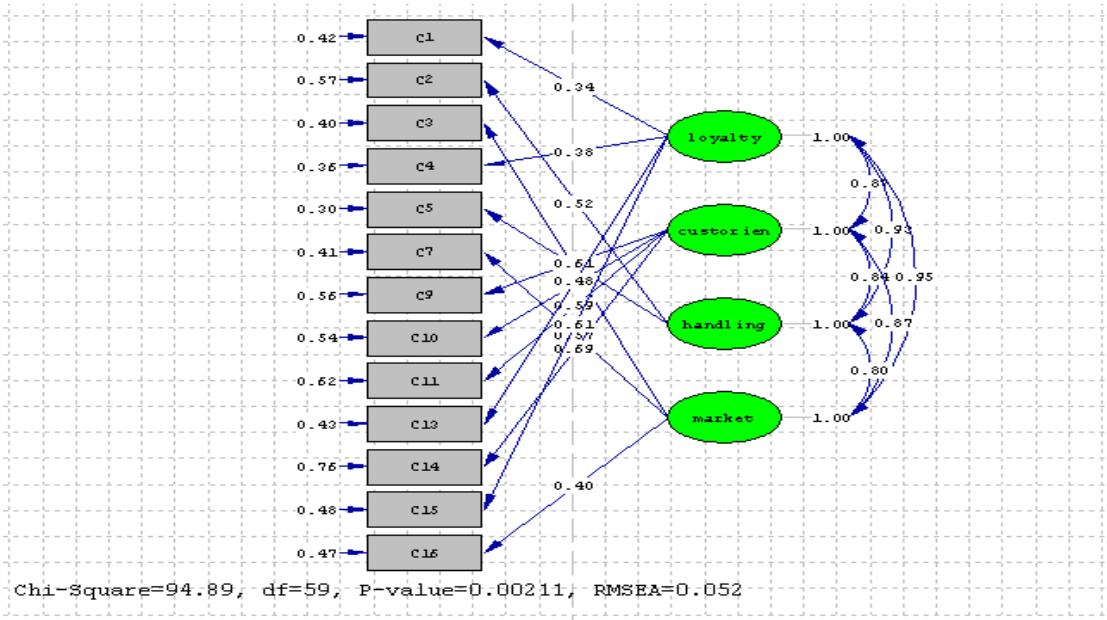

Fig. 7: Client capital measurement model by using the confirmed factor analysis

results that are obtained from LISREL software output, the less value of χ^2, the more appropriate model is the offered model:

χ^2 = 163.33, df = 59, RMSEA = 0.08, GFA = 0.90, AGFA = 0.85

By considering the results of the LISREL, output of nonstandard estimation section of the model one can conclude that structural capital measurement model is almost an appropriate model because its Chi-square value and its RMSEA value are low and its GFI value and AGFI value are near to 90% (Fig. 6).

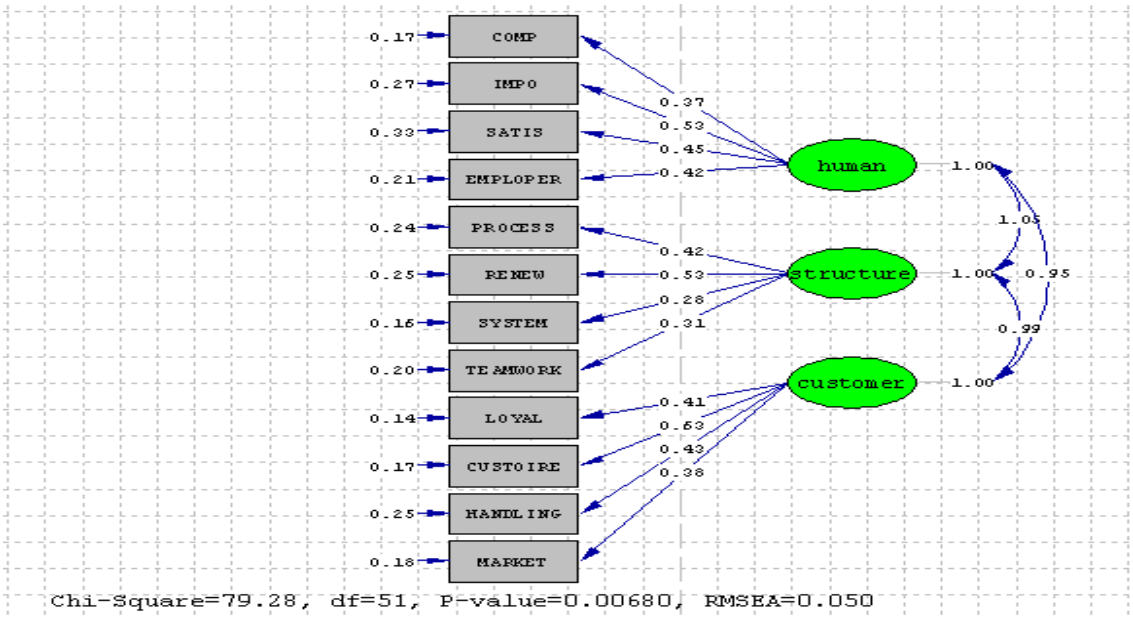

Fig. 8: Hypotheses conjugation test between intellectual capitals

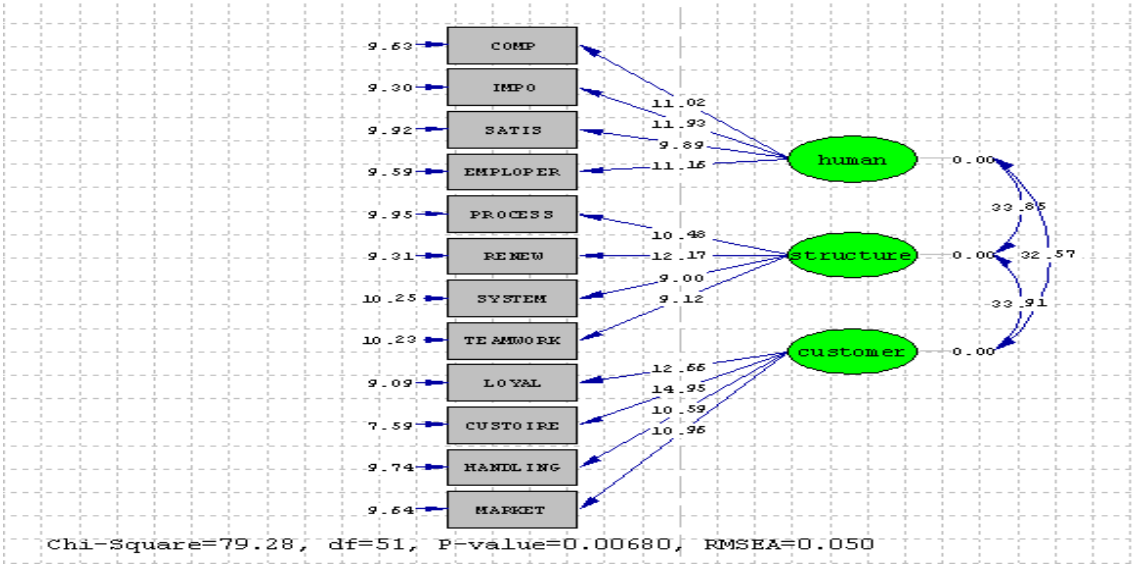

Fig. 9: Measurement model for significance of relationship between intellectual capitals

According to LISREL output, the value of the calculated χ^2 is 94.89. Low χ^2 indicates the appropriate feeding of the model. According to the following results that are obtained from LISREL software output, the less value of χ^2, the more appropriate model is the offered model:

χ^2 = 94.89, df = 59, RMSEA = 0.052, GFA = 0.94, AGFA= 0.91

By considering the results of the LISREL, output of nonstandard estimation section of the model one can conclude that Client capital measurement model is an appropriate model because its Chi-square value and its RMSEA value are low and its GFI value and AGFI value are above 90% (Fig. 7).

In the following parts test of three hypotheses conjugation between intellectual capitals with structural equation model was done. According to LISREL output, the value of the calculated χ^2 is 79.28. Low χ^2

indicates the appropriate feeding of the model. According to the following results that are obtained from LISREL software output, the less value of χ^2, the more appropriate model is the offered model (Fig. 8):

χ^2 = 79.28, df = 51, RMSEA = 0.05, GFA = 0.94, AGFA= 0.92

By considering the results of the LISREL output of nonstandard estimation section of the model it is obvious that measurement model of assessing the relations between intellectual capitals is an appropriate model because its Chi-square value and its RMSEA value are low and its GFI value and AGFI value are above 90%. The next output shows the significance part of the obtained coefficients and parameters from measurement model of assessing the relations between intellectual capitals that all of the obtained coefficients have become significant because the value of significance test of any one of them is more than 2 and less than -2 (Fig. 9).

Now the next question is that how much is the rate of this conjugation between intellectual capitals?

By considering the LISREL output, it was understood that this conjugation between structural and human capitals is 1.05 while between client and human capitals is 0.95 and between client and structural capitals is 0.99. Also investigating the results of data analysis indicated that these capitals (client, structural and human capitals) have no relationship with organizational performance.

RESULTS AND DISCUSSION

This study with proposed hypotheses tried to deduce following results:

There is a significant and strong positive relationship between human capital and structural capital in EN Bank branches of Tehran province and this relationship indicates that any increase in human capital causes an increase in structural capital and vice versa. Besides, considering the test results, it was confirmed that is there is a significant and strong positive relationship between human capital and client capital in EN Bank branches of Tehran province. This relationship mentions that any increase in human capital causes an increase in client capital and vice versa. This relationship is well confirmed in chain model of interest-service that any effort for the increase of employees' satisfaction (as a part of human capital) causes the increase of client's satisfaction (as a part of client capital).

Furthermore, the statistical test results of above hypothesis confirmed that there is a significant and strong positive relationship between structural capital and client capital in EN Bank branches of Tehran province and this relationship reveals that any increase in structural capital causes an increase in client capital and vice versa. Whereas, by taking the statistical test results (conjugation value is -0.091 and it is insignificant) in to consideration, it was demonstrated that above hypothesis has not been confirmed in this study and there is no significant relationship between human capital and organizational performance in EN Bank branches of Tehran province.

Moreover, considering the statistical test results (conjugation value is -0.051 and it is insignificant) revealed that the above hypothesis has not been confirmed the significant relationship between structural capital and organizational performance in EN Bank branches of Tehran province. Additionally, through reviewing the statistical test results (conjugation value is -0.054 and it is insignificant) it was cleared that the above hypothesis has not been confirmed the significant relationship between client capital and organizational performance in EN Bank branches of Tehran province.

CONCLUSION

The research model and study findings hold several important results. According to these results from data analysis, it can be deduced that that in EN Bank branches of Tehran there are strong mutual relationships between the components of intellectual capitals (human capital and structural capital and client capital) but these capitals and the relationships between them are not related to organizational performance. Besides, the results of this study are well concordance with the findings of the conducted researches in abroad (Wang and Chang, 2005; Bontis *et al*., 2000). The results of mutual relations between the components of intellectual capitals (human capital and structural capital and client capital) and the effects of these capitals on each other can be mentioned as an example. While, there was not such a concordance with the results of effectiveness of these capitals and the organizational performance. It maybe occurred because; however, this human capital issue according to this case in EN Bank (and maybe in most of the Iranian organizations) is in an appropriate level, but enough attention has not been paid yet. Besides, method of using these intellectual capitals in order to affect the organizational performance; that is using these intellectual capitals is not along the implementation of organizational strategies. As a result, in order to solve this problem using balanced scorecard and strategy maps can be proposed. Using balanced scorecard and

strategy maps help organizations to be able to use intangible assets and intellectual capitals for fulfillment of their performance goals and strategies; that is a kind of parallelism and touch ability is settled between the factors.

RECOMMENDATIONS

It is highly recommended to use balanced scorecard and strategy maps. Considering that balanced scorecard and strategy maps are means for transforming intangible assets (intellectual capitals) to tangible consequences (organizational performance), thus in this study for effecting these assets on each other and also on the organizational performance, balanced scorecard and strategy maps are suggested. Through these two tools, organizations are able to define and measure and manage cause and affect relationships between their components of intangible assets and tangible consequences. Balanced scorecard is a confirmed and scientific method that can be considered as three management systems, strategic planning system and organizational performance evaluation system. This method transforms organization's perspective and strategies in goals and scales that are realized in the following quad aspects:

- Financial aspect (How should we view our shareholders?)
- Client aspect (How do clients view us?)
- Internal processes aspect (To what internal processes should we achieve?
- Growth and learning aspect (How can we give continuity to improvement and value creation?)

In addition, balanced term refers to a kind of equilibrium and balance that this method settles between financial and nonfinancial goals, short term and long-term goals, internal and external goals. Figure 10 shows the correspondence of the aspects of the present study with balanced scorecard. Here researchers' recommendation forms in this way that if balanced scorecard is considered as an organizational performance evaluation system. Three components of intellectual capital, including human capital and structural capital and client capital and the calculated performance by data envelopment analysis can be considered in the form of quad views of balanced scorecard. Human capital with emphasis on learning aspects, is well coincided with growth and learning view and client capital can be imagined in clients' view and structural capital is presented in the view of internal processes and calculated organizational performance by data envelopment analysis in the financial view of

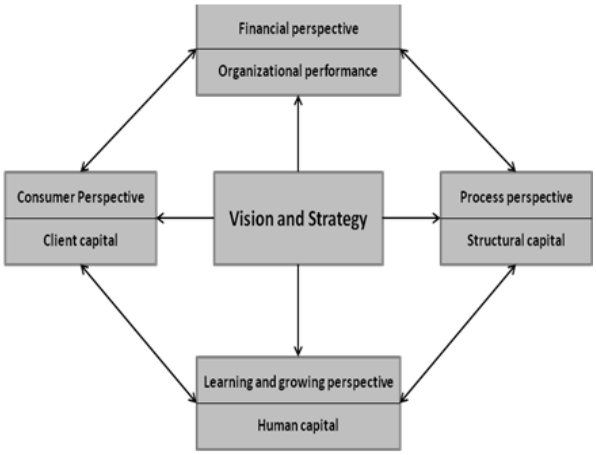

Fig. 10: Correspondence of the aspects of the present study with balanced scorecard

balanced scorecard. In this study in order to have an effective performance regarding organizational strategies, the relative organization should coordinate its intellectual capitals rate and kind through strategy maps, define, measure and manage them toward organizational performance.

In addition to the above general recommendation, in order to amplify any aspect of intellectual capital, it is recommended that each of aspects be amplified and improved through considering their subset factors.

In order to amplify the structural capital, teamwork amplification, process improvement, making flexible systems and structures, renewal and improvement are recommended.

In order to amplify the human capital, enhancement of employees' competency level, enhancement of employees' satisfaction, enhancement of employees' performance, more using of employees' improvement systems are recommended.

In order to amplify the client capital, enhancement of client orientation, improvement of clients' governance, enhancement of clients' devotion and increase of marker orientation are recommended that is better to be considered by future researchers.

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