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INVESTIGATING THE RELATIONSHIP BETWEEN INTELLECTUAL CAPITAL AND ECONOMIC VALUE ADDED OF LISTED COMPANIES IN TEHRAN STOCK EXCHANGE

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ABSTRACT
In knowledge-based economy, intellectual capital is used to create and increase the company's value. The success of managers of economic enterprises depends on the effective use of scarce resources. In today's knowledge-based societies, the return of employed intellectual capitalism or important than there turn off inancial capital. This study examined the relationship between intellectual capital and economic value added. The statistical population of the study consisted of listed companies in Tehran Stock Exchange over the period of 2007 - 2012. From the eligible companies, a sample consisted of 62companies were selected. The research was investigated a major hypothesis and three other sub-hypotheses. The main hypothesis states that there is a relationship between intellectual capital and economic value added. To summarize the data, the variables were fed into Excel and then were processed using Eviews7 software in order to test the formulated hypotheses. The method used in this study was panel data with fixed effects. According to the results of the subsidiary hypotheses, and demonstrating the relationship between the individual components of intellectual capital and economic added value, it can be stated that a significant relationship exists between the intellectual capital and economic value added.

Keywords: Economic Value Added, Human Intellectual Capital, Structural Intellectual Capital, Relational Intellectual Capital

In a knowledge-based organization where knowledge makes up a considerable part of a product's value and the organization's wealth ,traditional accounting methods which are based on tangible assets as well as information related to the past operations of the organization are in adequate for valuing intellectual capital which is the organization`s largest and most valuable asset. Thus, intellectual capital approach is more comprehensive for organizations that want to be well-informed of the value of their performance (Sullivan, 2000). Organizations need information and knowledge to participate in today's market in any shape and form and to improve their performance. In today's knowledge-based societies, the return of employed intellectual capital is more important than there turn of financial capital. This implies that, in comparison with the intellectual capital, the role and importance of financial capital in determining sustainable profitability have dramatically been reduced.

Economic Value Added is a measure that satisfies these demands because we have to pay attention that for how much capital we were able to gain the returns. There turns, of course, should be commensurate with the rate of capital cost. But what creates the value added in the firms may result from the assets that are impossible to measure and are considered as the hidden assets of the company. Presence or absence of these assets and the hidden power of companies in creation of economic value added will appear in the intellectual capital. Thus, regardless of intellectual capital and its relationship with economic value added, it is expected that making economic decisions in determining values of companies is some what difficult (Bontis, 2009). Additionally, determining the economic value regarding the development of capital markets is one of the most important interesting topics to shareholders, creditors, governments and managers. Investors always tend to be aware of how much managers are successful in using their capitals.

Research Article

They like to know how much value is created from the investment. Creating value and increasing shareholders' wealth in long term are the main objectives of the companies.

To this end, analysts are looking for a criterion to maximize firm value and increase shareholder wealth by considering the cost of capital and rate of return on investment (Marr, 2012). This study examines the relationship between intellectual capital and economic value added in the listed companies in Tehran Stock Exchange, so that, on the one hand, help managers and investors to the be careful in choosing the most profitable and knowledge-based corporations and on the other hand, show the importance of this subject that, to what extent considering the intellectual capital and physical infrastructure required for it can be effective on EVA in Iran.

THEORETICAL FRAMEWORK

In the twentieth century, economy was based on industry. In this century, every company and every country that had more physical and financial assets would generate more wealth. But the twenty-first century is the century of knowledge-based economies. Intellectual capital is a capital beyond physical and tangible assets. Today, intellectual capital due to the production of knowledge and information and consequently production of wealth in knowledge-based economy has a critical role in creating value added and gross domestic product. Therefore, at the level of economic enterprises, financial performance could be affected by intellectual property and human capital (Chen, 2004). The philosophy underlying economic value added is that investors expect reward in exchange for providing financial resources and incurring business risks. In order to create value for shareholders, the company's operating profit must be greater than the cost of capitals. In calculating earnings, only the cost of financing caused by debt is taken into account and managers assume that the funds are provided by shareholders without any charge. But in terms of economic value added, cost of financing by the shareholders is also taken into account for any assets have a cost. Among all approaches to performance measurement, the approach based on residual income and economic value added has attracted more attentions. Due to the relative importance of intellectual capital in increasing company's value as the most important part of the total capital of the company, this study tries to deal with the relationship between intellectual capital and the index of measuring companies` performance , considering importance level of the this index in economic value-based management approach. On the other hand, in knowledge-based approach, intellectual capital is a key issue for achieving a competitive advantage, since competitive advantage is considered as a major issue in decision making. In knowledge-based economy, intellectual capital is used to create and enhance corporate value. Firms' success depends on the effective use of scarce resources. Today, the intangible aspect of the economy is established on the basis of intellectual capital and its primary material is knowledge and information (Klein, 2010). Therefore, it is expected that through conducting this study the contribution of intellectual capital in determining economic value added in a company is determined so that investors do not make any mistakes in their investments, and optimal allocation of resources in firms with high intellectual capital is done well.

This study is to answer the question "what is the relationship between the economic value added of a company and its intellectual capital?"

"The more the intellectual capital of an organization, the higher will it create value added?"

Paying attention to intellectual capital and its relationship with economic value added can lead to creation of a new approach in the field of economic value added among investors. It also makes authorities to pay more attention to this type of companies' hidden capital concerning a change from traditional capitalism and focus on the potential value of companies.

BACKGROUND INVESTIGATIONS

The first experimental study to measure intellectual capital in the mid-1980s was done by a Swedish association. In the 1990s, concurrent with the development of the market value of knowledge-based organizations, researchers and theorists became interested in the concept of intellectual capital increase.

Research Article

Given the breadth of these studies are examples of the most important studies in recent years, which are reflected in the following section.

Chen *et al* (2005) examined the relationship between intellectual capital, market value, and financial performance of companies in Taiwan's stock market during 1992 and 2002. The results indicated a positive impact of intellectual capital on financial performance and market value of the company. This research also showed that intellectual capital could be used as an index for predicting future financial performance.

Tan and colleagues, in a study conducted in 2007, examined the relationship between intellectual capital and financial performance of 150 firms between 2000and 2002, from the Singapore Stock Exchange. They concluded that intellectual capital and financial performance of these companies also have a significant positive correlation.

Furthermore, intellectual capital and firms' future performance, as well as the growth rates of intellectual capital and firm performance have a direct relationship with each other. On the other hand, the contribution of intellectual capital on firm performance varied with the industry. In 2009, Kamas examined the impact of intellectual capital on the traditional criteria for evaluating the performance of 25 of the Indian pharmaceutical industries in a 10-year period from 1996 to 2006. Using multiple linear regression analysis, he showed that none of the performance measures and intellectual capital had any profitability, and efficiency of physical and financial capital was more important. Gosh and Mandal (2009) examined the relationship between intellectual capital and financial performance of 80 software and pharmaceutical companies in India, in a five-year period. They concluded that there was a significant relationship between intellectual capital and profitability. But the relationship between intellectual capital and the productivity and market value was not significant .

Zigal and Malol (2010) examined the impact of intellectual capital on economic performance, financial and market shares of 300 companies in 2005. The results indicated that intellectual capital had a positive impact on the economic and financial performance, but the relationship between intellectual capital and stock market performance, only the high-tech industry, was significant. The results also indicated that, although the employed capital and stock market performance were still the main financial factors but the capital had a negative impact on economic performance.

THE HYPOTHESES OF THE STUDY
To fulfill the purpose of this study, a main hypothesis and three sub-hypotheses are formulated as follows:

The main hypothesis of the research
1) There is a significant relationship between intellectual capital and economic value added.

Secondary research hypotheses
2) There is a significant relationship between human capital and economic value added.
3) There is a significant relationship between Customer capital and economic value added.
4) There is a significant relationship between structural capital, and economic value added.

RESEARCH METHODOLOGY
The present study is applied and descriptive-analytic due to the use of random sample and generalizing the results.

The combined data (combined data time series and cross section data) have been used. Because in the present study, actual and historical data were extracted from all relevant sites, such as the Stock Exchange, the New Deal and other software, electronic archives, papers, books, and related documentation has been used, it can be of research type of classification based on previous data. The ultimate goal of the current study is to find the correlation between the two elements of intellectual capital and its components, which are stability of earnings.

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The effect of firm size as a modulator factor on the relationship between these two variables has also been examined. The study was carried out over a six-year period (from the years 2007 and 2012. The sample of this research was selected from all firms listed in Tehran Stock Exchange for the period of time mentioned above which had the following characteristics:

1. The companies are listed on the Stock Exchange prior to 2007 and they have not been removed from the list of companies until the end of 2012.
2. They shouldn`t have transaction interruption during the financial year
3. In the study period, the company should not be operating loss in its fiscal year-end audited income statement.
4. In order to increase comparability, the financial year of the companies is based on the calendar year.

Thus, considering the above-mentioned limitations, 101 companies were identified as eligible out of which 62 companies were chosen as the target sample using simple random sampling.

In this study, we used frequency distribution and parameters including mean, standard deviation, coefficient of elongation and kurtosis. First, descriptive statistics including mean, median, variance, skewness, and kurtosis were calculated for variables and then through using panel's analysis the best relationship(if there is a relationship) between the independent and dependent variables was estimated. In the panel analysis, we calculated the significance level F -statistic and the significance level of each independent variable.

VARIABLES

Dependent variable
In this study, the economic value added is considered as the dependent variable and is calculated using the following equation:

$$EVA = I_i + DP_i + D_i + T_i + M_i + R_i$$

I_i: Interest expense
DP_i: Annual depreciation expense
D_i: Dividends
T_i: Tax
M_i :Equity
R_i: Retained earnings

Independent variable
In the basic model of intellectual capital, the independent variable includes the following:
Relational capital (Customer capital) (CEE)
The main theme of customer capital is the knowledge in channel marketing and customer relations, and a major factor in the transforming intellectual capital to the market value and, consequently, business performance of organization. To measure this variable, we used rate of sales growth.
Human capital(HC)
Human capital of an organization includes the skills, expertise, problem solving ability and leadership styles. Human capital as a base for intellectual capital that results in improved performance and making profits for the company. To measure this variable, we used three following criteria:
- ✓ Number of employees
- ✓ Capital sales per employee
- ✓ Net profit per employee

Research Article

Structural capital(SC):
Structural capital includes databases, organizational charts, administrative procedures, processes, strategies and implementation plans. To measure this variable, we used the following criteria:
- ✓ The cost of distribution and sales per employee
- ✓ advertising expenditure per employee

THE RESEARCH FINDINGS

Descriptive Statistics
Before testing there search hypotheses, descriptive statistics of the variables calculated and is presented in Table1. This table contains descriptive statistics of the independent and dependent variables.

The first sub-hypothesis
The first sub-hypothesis**:** There is a significant relationship between human capital and economic value added.
The results of the estimation model and other calculations, and tests indicated that:
- The high F-statistic model (165.8057) indicates the significance of the entire regression.
- T-Statistics and the probability related to it indicate meaningfulness of independent variablesat95% confidence level.
- R-squared indicates that 97% of the variation in the dependent variable is explicable by the independent variables, which indicates the high explanation power of the model.
- In this model, Statistic Durbin -Watson equals 1.933, which rejects the assumption of Self-correlation between components of the model.

Hence, considering the results in Table2, it can be concluded that there is a significant positive relationship between human capital and economic value added.

The second sub-hypothesis
The second sub-hypothesis: There is a significant relationship between Customer capital and economic value added.
The results of the estimation model and other calculations, and tests indicated that:
- The high F-statistic model (78.54318) indicates the significance of the entire regression.
- T-Statistics and the probability related to it are indicative of meaningfulness of independent variables at 95% confidence level.
- R-squared indicates that 94% of the variation in the dependent variable is explicable by the independent variables, which is indicative of the high explanation power of the model.
- In the model Statistic Durbin -Watson is equal to1.845, which rejects the assumption of Self-correlation between components of the model.

Considering results in Table3, it can be concluded that there is a significant positive relationship between customer capital and economic value added. According to the research model coefficients in Table 3, this relationship indicates that there is a significant relationship between the rate of sales growth and economic value added.

The third sub-hypothesis
The third sub-hypothesis**:** There is a significant relationship between structural capital, and economic value added.
The results of the estimation model and other calculations, and tests indicated that:
- The high F-statistic model (118.0126) indicates the significance of the entire regression.
- T-Statistics and the probability related to it are indicative of meaningfulness of independent variables at 95% confidence level.

Research Article

- R-squared indicates that 96% of the variation in the dependent variable is explicable by the independent variables, which is indicative of high explanation power of the model.
- In this model, Statistic Durbin –Watson equals 1.941682, which rejects the assumption of Self-correlation between components of the model.

Considering the results in Table4, it can be concluded that there is a significant positive relationship between structural capital and economic value added. According to the research model coefficients in Table 4, this relationship indicates that there is negative and significant relationship between the advertising expenditure per employee and economic value added and there is a significant positive correlation between the cost of distribution and sales per employee, and economic value added.

Table1.Descriptive statistics of variables

	EVA	Capita sales per employee	rate of sales growth	Net profit per employee	Net profit	The cost of distribution and sales per employee	advertising expenditure per employee
Mean	1138577	657.7915	0.227931	134.6747	326399.5	198.7844	44.9467
Median	309788.5	221.2099	0.131363	38.50304	84944.87	56.38513	11.62638
Maximum	30249711	29860.18	9.021160	3437.705	8965084.	10631.06	2276.165
Minimum	-619292	5.261418	-0.721527	-65.85963	-506910.8	0.545837	0.139619
Std. Dev.	293228.3	1959.768	0.813637	352.9548	907247.1	663.6959	149.7320
Skewness	0.033873	0.0945514	0.0508778	0.600056	6.614890	11.33441	10.16820
Kurtosis	3.69726	6.5243	1.64148	4.23919	5.33925	7.74541	1.1672
Observations	372	372	372	372	372	372	372

Table2-Regression coefficients in the first sub-hypothesis testing

	coefficient	Std. Error	t-Statistic	Prob.
Net profit	1.517011	0.083360	18.19827	0.0000
Number of employees	20.47427	2.729403	7.501372	0.0000
Net profit per employee	-1359.353	169.9015	-8.000830	0.0000
Capita sales per employee	315.6753	39.14378	8.064508	0.0000
Constant value	550799.5	23147.14	23.79557	0.0000
R-squared	0.972391	F- statistic		165.8057
Adjusetd R-squared	0.966526	Durbin-Watson stat		1.933641
S.E. of regression	547221.9	Prob		0.0000

Table3-Regression coefficients in testing the second sub-hypothesis

	coefficient	Std. Error	t-Statistic	Prob.
Net profit	1.342511	0.084432	15.90053	0.0000
rate of sales growth	-18226.15	4609.299	-3.954213	0.0001
Constant value	704536.4	27712.09	25.42343	0.0000
R-squared	0.941403	F- statistic		78.54318
Adjusetd R-squared	0.929417	Durbin-Watson stat		1.844546
S.E. of regression	584831.0	prob		0.000000

Research Article

Table4- Regression coefficients in testing the third sub-hypothesis

	coefficient	Std. Error	t-Statistic	Prob.
Net profit	1.044717	0.099337	10.51694	0.000
The cost of distribution and sales per employee	1526.717	419.4318	3.639965	0.0003
advertising expenditure per employee	-4519.916	1636.579	-2.761807	0.0061
Constant value	697249.8	31014.72	22.48125	0.000
R-squared	0.960941	F- statistic		118.0126
Adjusetd R-squared	0.952798	Durbin-Watson stat		1.941682
S.E. of regression	648051.7	Prob		0.000

CONCLUSIONS

According to the results of the first, second and third sub-hypothesis, it can be stated that there is a significant relationship between human capital, relational capital, structural capital and economic value added. Thus, considering the proven relationship between the individual components of intellectual capital and economic value added, it can be argued that there is a significant relationship between intellectual capital and economic value added at 95% confidence level.

Based on the results of research, it is suggested that investors in the Tehran Stock Exchange invest in companies that take the intellectual capital into consideration. Because an increase in the intellectual capital will cause an increase in value-added companies and in turn, it causes an increase in shareholder value. Senior managers are also recommended to pay more attention to the issue of intellectual capital to increase company value.

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