

## The role of intellectual capital in value added created for stockholders and companies

Peyman Imanzadeh<sup>1\*</sup>, Mina Lalepour<sup>2</sup>, Amir porgholi haredasht<sup>3</sup>

<sup>1, 2, 3</sup>Department of Accounting, Talesh Branch, Islamic Azad University, Talesh, Iran  
\*[pi\\_imanzade@yahoo.com](mailto:pi_imanzade@yahoo.com)

**Abstract:** Maximizing the wealth of stockholders, carrying out moral duties and social responsibilities are among the most important goals of the companies. The intellectual capital of the companies is one of the factors which can have a considerable effect in realizing these goals. On the other hand the innovative changes which are created by economic value added in two fields of financial management and investment is considered to be an internal drive to maximize the effectiveness and efficiency of activities. Regarding what was said, the main goal of the present research is to study the coefficient of economic value added of intellectual capital on the performance criteria based on value. The time period for our study is between 2005 and 2010 and our statistical population includes 121 firms accepted in Tehran Stock Exchange. The results of testing the research hypotheses approved the positive effect of the coefficient of economic value added of intellectual capital on the criteria creating economic value added in companies. [Peyman Imanzadeh, Mina lalepour, Rademan Malihi Shoja. **The role of intellectual capital in value added created for stockholders and companies.** *Life Sci J* 2013;10(1s):293-299] (ISSN: 1097-8135). <http://www.lifesciencesite.com>.

**Keywords:** the value created for stockholders, economic value added, Palic's pattern, intellectual capital efficiency

### 1. Introduction

During second half of the 20<sup>th</sup>. Century the role and importance of knowledge in economy and business has changed a lot. The importance of this issue is so considerable that the European Union introduced changing itself into the economic pole in the world based on knowledge as its most important goal it its summit in the year 2000 in Lisbon in Portugal. On the other hand, during the previous three decades the idea of value and wealth created for the stockholders along with the formation of big companies and multinational corporations all over the world have been posed. Maximizing the wealth of stockholders, carrying out moral duties and social responsibilities are among the most important goals of the companies. The intellectual capital of the companies is one of the factors which can have a considerable effect in realizing these goals. The importance of intellectual capital is so much that Behardwaj introduces intellectual capitals and intangible assets of a company as the most important and valuable resources of it in his articles and speeches. He believes that tangible assets can be easily copied or purchased in a free market, thus they can not be considered as the strategic assets of a company and create competitive advantages for that company (Rezaee & et al, 2010). To do this and to achieve these merits, today organizations should categorize their assets again and should understand how they can support their strategic goals and they should quantify their shares in creating value for the

organization and stockholders and they should have an appropriate comparison of their assets with assets of other organizations. In the present research following the previous studies we are going to study the effect of intellectual capital of the companies regarding economic value added approaches in creating value for stockholders and companies.

### 2. The conceptual framework

Investor's purpose is to gain more benefits and maximize their wealth. Investors by investing their wealth postpone current consumption of their wealth in order to achieve more consumption in the future. Thus, in order to accomplish this, they invest on the assets that have high returns and relatively low risks. Exchange rate return of a share is the major factor in selection of investment. (Nouravesh & et.al, 2004). Intellectual capital means, trying to effective use of existing knowledge and intangible assets. Dimensions of intellectual capital are:

1- Employed capital. 2- Human capital and 3- Structural capital.

Employed capital refers to the total current and long term assets. If we look at that from sources of balance sheet point of view, it contains total shareholder's equity and long-term debts. If we look at that from uses of balance sheet point of view, fixed assets and working capital is included in employed capital. Human capital refers to performance of staffs in producing tangible and intangible assets through the development of idea and knowledge. Structural capital contains tangible items such as patent rights, trademarks, data banks and intangible items such as culture, transparency and trust between the

employees. Explanation of the necessity of intellectual capital is done by Tonka, as one of the pioneers of knowledge management: in the economy that only certainty and reliability, is uncertainty and unreliability, a stable and reliable source to gain competitive advantage in organizations is knowledge.... Successful companies are those that constantly generate new knowledge and spread it throughout the whole organizations and are continuously seeking new technologies and products (Shaemi Brzzki, 2005).

### 3. Performance measures based on value added

Regarding that stockholders and creditors appropriate their limited resources to economic entities, the assessment of an entity's performance is considered to be very important and critical in order to make sure about the optimal appropriation of the limited resources. Performance measurement indexes based on value are used more commonly in comparison to the traditional indexes based on the historical data in assessment process in order to acknowledge about the amount of value creation in economic entities. They are more useful in conscious and consistent judgment because the concepts of value and value creation are considered as the basis and the goal. Performance measurement is one of the managerial duties and its objective concept is realized in profession and business and management (Rahnomaye Roudposhti & et al, 2006). One of the important characteristics of performance measures of value added is that they are directly related with capital budgeting techniques which are used in financing for the companies; specially the economic profit which is comparable to the techniques related to the current net value and is used in capital budgeting of the entities. Value added measures are basically used to measure the management's performance which is based on the ability of managers in increasing the firm value. These measures are also used by the analysts of bonds because it is believed that the management's performance can be reflected in stock returns of the companies (Rahnomaye Roudposhti & et al, 2006). In the present research we will study the effect of intellectual capital on some of the measures based on value added in the companies which will be described in details below.

#### 3.1 Created shareholder value (CSV)

If the rate of return of investor is greater than expected rate of return, value of invested asset is more and more wealth is created. This increase is referred as shareholder's created value (CSV). This criterion is one of the methods of assessing and determining the value of the company that is

proposed by Fernandez (2001). In general this criterion indicates that a company creates value for shareholders if return of shareholders is more than their expected return. Or in other words a company at the end of the financial year creates value for its shareholders that its created value is more than predicted value (Bradaran-e-Hassanzadeh & et.al, 2012).

#### 3.2 Economic added value (EVA)

Creating value in the company and maximize shareholders wealth is one of the major priority of companies. By considering that increasing wealth is gained optimal performance, therefore, several criteria have been proposed for evaluating the performance of business units that criteria of the economic added value and the value created for shareholders are of the newest and most efficient measures. Measure of economic added value (EVA) has been proposed in 1982 by Stern Stewart Institute. This is an Innovative way to find the true value of companies and executives and reflects the organization's internal performance (Talebnia & et.al, 2012).

#### 3.3 Cash Value Added (CVA)

The concept of cash value added is mostly similar to economic value added; the difference is that economic value added estimates the whole wealth created by a company during a financial period, but cash value added calculates only a part of them. In other words, cash value added is the same as economic value added in which non-cash items are omitted (Rezaee & Ebanejhad, 2011).

#### 3.4 Market Value Added (MVA)

Unlike economic value added which is a general assessment of the internal performance of a company market value added is a measure to assess its external performance. Market value added equals the sum of market value of owners' equity and market value of its debts. Theoretically, this amount is the one that can be calculated and gained in any certain moment from the market (Hejazi & Hosseini, 2006).

### 4. Research Literature

Edwinson (1996) is one of the pioneering scholars in intellectual capital studies. He described the difference between market value and book value as the intellectual capitals value. Chin Cho & et al (2005) used Palic's model of intellectual capital value added (2000) as the criterion for measuring intellectual capital and by administering the regression model showed that higher intellectual capital in the companies will result in improving the financial performance and market value of the stocks

of the companies. Nahandi & et al (2012) studied the relationship between corporate governance structures and the coefficient of economic value added to human capital. The results show that there is a positive and meaningful relationship between the variables of the number of members of the board of directors, size and profitability and human capital.

The research results by Anwari-e-Rostami showed that intellectual capital has a high correlation with stock's market value. Esmaeelzadeh-e-Magharri (2010) studied the relationship between intellectual capital and the profit before taxation interest, operational cash flows and value added. The research results approved that there is a meaningful and positive relationship between intellectual capital and value added in companies. Rezaee & Ebanejhad (2011) studied the descriptive power of the value created by the help of the intellectual capital pattern and surplus profit. The results showed that there is a meaningful and positive relationship between intellectual capital pattern and the value created for the stockholders. Also from among the performance patterns based on surplus profit, only economic value added has a positive and meaningful relationship with the value created for the stockholders. In the level of %95 of assurance, the identification power of intellectual capital is more than economic value added. Additionally, these results showed that the usefulness of utilizing the pattern of measuring intellectual capital regarding CIV (Calculated Intangible Value Pattern) method is more compared to Palic.

## 5. Research method

The research is capital market research type regarding accounting researches and regarding the goal it is considered to be applied. The methodology regarding the research title is descriptive and correlation type. It is descriptive because the goal is to define the conditions or phenomena under investigation and it is used to know more about the current situation and it is correlation because our aim is to investigate the relationships between the variables. The novelty and innovative nature of the present research is realized in the issue that by using economic value added measure in intellectual capital model of Palic (2003), the intellectual capital will be noticed regarding the coefficient of economic value added. For examining the hypotheses, multiple Regression and identification Coefficients are used and interpreted with respect to output data from SPSS software

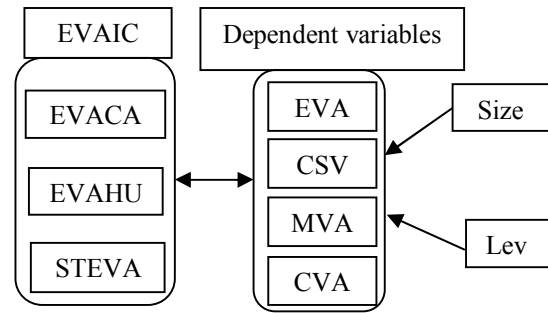


Figure 1: conceptual framework of the study

## 6. Research Hypotheses

In order to study the role of intellectual capital in the value created for the stockholders there are four main hypotheses considered. Each of them also entails four minor hypotheses including the

effect of the coefficient of economic value added of intellectual capital and the coefficients of economic value added of each of the elements of intellectual capital (the capital utilized, human capital, structural capital) on the measures creating value for the stockholders.

### H<sub>1</sub>: Intellectual capital affects on the Market Value Added.

H<sub>1a</sub>: Capital employed efficiency affects on the Market Value Added.

H<sub>1b</sub>: Human capital efficiency affects on the Market Value Added.

H<sub>1c</sub>: Structural capital efficiency affects on the Market Value Added.

### H<sub>2</sub>: Intellectual capital affects on the economic added value.

H<sub>2a</sub>: Capital employed efficiency affects on the economic added value.

H<sub>2b</sub>: Human capital efficiency affects on the economic added value.

H<sub>2c</sub>: Structural capital efficiency affects on the economic added value.

### H<sub>3</sub>: Intellectual capital affects on the created shareholder value.

H<sub>3a</sub>: Capital employed efficiency affects on the created shareholder's value.

H<sub>3b</sub>: Human capital efficiency affects on the created shareholder's value.

H<sub>3c</sub>: Structural capital efficiency affects on the created shareholder's value.

### H<sub>4</sub>: Intellectual capital affects on the Cash Value Added.

H<sub>4a</sub>: Capital employed efficiency affects on the Cash Value Added.

H<sub>4b</sub>: Human capital efficiency affects on the Cash Value Added.

H<sub>4c</sub>: Structural capital efficiency affects on the Cash Value Added.

**5. Variable definition**

**5.1. Independent variables**

The coefficient of economic value added (economic efficiency) of intellectual capital (EVAIC) is the independent variable in the present research. Based on Palic's pattern and regarding that economic value added is used instead of value added in Palic's model, to calculate the independent variable we should do the followings:

**First step:** calculating economic value added (EVA)

$$EVA = NPPAT_t - [(TA_{T-1} - CL_{T-1}) * WACC_t]$$

$$NOPAT_t = OP_t * \{1-t\}$$

TA: total assets in the beginning of each financial period

CL<sub>T-1</sub>: sum of current liabilities in the beginning of each financial period

NOPAT<sub>t</sub>: net operational profit after taxation in the financial period t.

WACC<sub>t</sub>: well-proportioned average capital cost in the financial period t.

OP<sub>t</sub>: gross operational profit in the financial period t.

**5.2. Dependent variables.**

**1. Market Value Added :** average of market value of owners' equity – average book value of owners' equity

**2. Economic Value Added:** This was described in independent variable calculations.

**3. Created shareholder's value**

CSV=the market value of firm's stock × (Rate of real return-rate of expected return)

$$\text{Rate of real return} = \frac{TEDPIX_t - TEDPIX_{t-1}}{TEDPIX_{t-1}}$$

$$\text{Rate of expected return} = R_f + (R_M - R_f) \times \beta_1$$

Where CSV is created value for shareholders, TEDPix is cash return index and whole price of stock market, R<sub>f</sub> is rate of return without risk, R<sub>m</sub> is rate of stock market return and B is defined as systematic risk (rezae, 2011).

**4. Cash Value Added** = cash profit after taxation – cash capital cost

Cash stock cost = interest paid + stock profit paid

**5.3. Control variables:**

**Firm size:** the logarithm of total assets of a company

**Financial leverage:** the ratio of total long-term liabilities to total assets

**6. Regression models**

In order to examine the hypotheses of the study, regression models have been evaluated.

$$y = \alpha + \beta_1(EVAIC) + \beta_2(Size) + \beta_3(Lev) + \varepsilon_{it}$$

$$y = \alpha + \beta_2(EVACA) + \beta_2(Size) + \beta_3(Lev) + \varepsilon_{it}$$

$$y = \alpha + \beta_3(EVAHU) + \beta_2(Size) + \beta_3(Lev) + \varepsilon_{it}$$

$$y = \alpha + \beta_4(ESTVA) + \beta_2(Size) + \beta_3(Lev) + \varepsilon_{it}$$

**7. Research findings**

**7.1. Descriptive statistics** and correlation coefficient tables of the variables are shown in Table1.

Table (1) Descriptive Statistics Research Variables

Variable	N	Min	Max	Mean	Std. Deviation
EVACA	720	-1.37	3.189	.0686	.1694
EVAHU	720	-9.84	9.987	1.325	2.482
STEVA	720	-56.4	97.35	.0588	8.579
EVAIC	720	-56.5	168.3	2.220	13.31
MVA	720	-.435	7.717	.4233	.7345
CSV	720	-13.9	7.270	-.051	.9217
CVA	720	-.43	1.709	.0726	.1650
Size	720	10.6	18.32	13.12	1.450
Lev	720	.168	2.755	.6591	.2582

**7.2. To test the normality of the data, Kolmogorov-Smirnov (K-S) test has been used.**

Table (2) Kolmogorov-Smirnov (K-S) test

Variables	MVA	CSV	EVA	CVA
K-S	.078	.158	.053	.041
Sig	.059	.000	.102	.200

**7.3. Hypotheses test results**

**H<sub>1</sub>: Intellectual capital affects Market Value Added.**

Table (3): the results of statistical analysis of the regression models' test of the first hypothesis (MVA)

Model	R <sup>2</sup>	D-W	P-Value, F
1	.113	1.820	.006
1a	.156	1.908	.000
1b	.219	1.976	.000
1c	.110	1.821	.017

The balanced identification coefficients are (0/113, 0/156, 0/219, and 0/110), respectively. This shows that the independent and controlling variables could describe (0/113, 0/156, 0/219, and 0/110) percent of the changes in the dependent variable, respectively. Durbin-Watson statistics is between 1/5 and 2/5 in all cases. Thus, there is not any self-correlation between the residuals of the regression pattern. The meaningfulness level of F statistics related to EVAHU, EVACA, and EVAIC is less than 0/05. Thus, the regression model of them is meaningful and at least one of the independent variables has had a meaningful effect on the dependent variable.

Table (4): the results of statistical analysis of the coefficients of the independent variables of the first hypothesis(MVA)

Model	Variable	$\beta$	t	P-value
1	EVAIC	.004	1.878	.061
	Size	-.055	-2.954	.003
	Lev	.044	.419	.676
1a	EVACA	1.665	11.211	.000
	Size	-.053	-3.033	.003
	Lev	.051	.521	.603
1b	EVAHU	.000	13.88	.00
	Size	.000	-5.027	.000
	Lev	.044	2.019	.044
1c	STEVA	.03	1.055	.292
	Size	-.056	-2.962	.003
	Lev	.038	.359	.720

Thus, there is not any serious co-linearity between the independent variables of regression models. The coefficients resulted for the variables EVAIC, EVACA, and EVAHU show that they have a positive and meaningful effect on market value added. And the coefficient resulted for STEVA is not meaningful and thus it did not have any effect on dependent variable.

**H<sub>2</sub>: Intellectual capital affects economic added value**

The balanced identification coefficients are ( 0/006, 0/947, 0/396, and -0/003), respectively. This shows that the independent and controlling variables could describe ( 0/006, 0/947, 0/396, and -0/003), percent of the changes in the dependent variable, respectively. Durbin-Watson statistics is between 1/5 and 2/5 in all cases. Thus, there is not any self-correlation between the residuals of the regression pattern. The meaningfulness level of F statistics related to EVAHU and EVACA is less than 0/05.

Table (5): the results of statistical analysis of the regression models' test of the Second hypothesis (EVA)

Model	R <sup>2</sup>	D-W	P-Value,F
2	.006	1.878	.056
2a	.947	1.889	.000
2b	.396	2.017	.000
2c	-.003	1.886	.773

Thus, the regression model of them is meaningful and at least one of the independent variables has had a meaningful effect on the dependent variable. The coefficients resulted for the variables EVAIC, EVACA, and EVAHU show that they have a positive and meaningful effect on economic value added. And the coefficient resulted for STEVA is not meaningful and thus it did not have any effect on dependent variable.

**H<sub>3</sub>: Intellectual capital affects created shareholder value**

Table (6): the results of statistical analysis of the coefficients of the independent variables of the Second hypothesis EVA

Model	Variable	$\beta$	t	P-value
2	EVAIC	.001	2.564	.011
	Size	.000	-.151	.880
	Lev	-.05	-.945	.345
2a	EVACA	1.070	113.201	.000
	Size	.001	1.221	.223
	Lev	-.020	-3.270	.001
2b	EVAHU	.048	21.726	.000
	Size	-.011	2.898	.004
	Lev	.026	1.224	.221
2c	STEVA	.000	-.332	.740
	Size	-.001	-.222	.824
	Lev	-.026	-.964	.335

The balanced identification coefficients are 0/000, 0/004, 0/112, and 0/000, respectively. This shows that the independent and controlling variables could describe 0/113, 0/156, 0/219, and 0/110 percent of the changes in the dependent variable, respectively. Durbin-Watson statistics is between 1/5 and 2/5 in all cases. Thus, there is not any self-correlation between the residuals of the regression pattern. The meaningfulness level of F statistics related to EVACA is less than 0/05. Thus, the regression model

Table (7): the results of statistical analysis of the regression models' test of the Third hypothesis (EVA)

Model	R <sup>2</sup>	D-W	P-Value,F
3	.000	2.174	.418
3a	.112	2.169	.009
3b	.004	2.162	.105
3c	.000	2.175	.458

of them is meaningful and at least one of the independent variables has had a meaningful effect on the dependent variable.

Table (8): the results of statistical analysis of the coefficients of the independent variables of the Third hypothesis EVA

Model	Variable	β	t	P-value
	EVAIC	.001	.505	.614
	Size	.038	1.614	.107
	Lev	.013	.096	.923
3a	EVACA	.606	3.002	.003
	Size	.039	1.668	.096
	Lev	.015	.116	.908
3b	EVAHU	.026	1.892	.059
	Size	.033	1.365	.173
	Lev	.041	.304	.761
3c	STEVA	.001	.149	.882
	Size	.038	1.605	.109
	Lev	.011	.085	.933

The coefficient resulted for the variable EVACA show that it had a positive and meaningful effect on value added created for the stockholders. And the coefficients resulted for the variables STEVA, EVAIC, and EVAHU are not meaningful and thus they have not any effects on value added for the stockholders.

**H<sub>4</sub>: Intellectual capital affects Cash Value Added.**

The balanced identification coefficients are (0/139, 0/203, 0/177, and 0/139), respectively. This shows that the independent and controlling variables could (0/139, 0/203, 0/177 and 0/139), percent of the changes in the dependent variable, respectively. Durbin-Watson statistics is between 1/5 and 2/5 in all cases. Thus, there is not any self-correlation between the residuals of the regression pattern. The meaningfulness level of F statistics related to EVACA, STEVA, EVAIC, and EVAHU is less than 0/05. Thus, the regression model of them is meaningful and at least one of the independent variables has had a meaningful effect on the dependent variable. Thus, there is not any serious co

-linearity between the independent variables of regression models. The meaningfulness level coefficient resulted for the variables EVACA, and EVAHU show that they have a positive and meaningful effect on cash value added. And the meaningfulness level coefficient resulted for variables STEVA and EVAIC are not meaningful and thus they did not have any effect on cash value added.

Table (9): the results of statistical analysis of the regression models' test of the Fourth hypothesis (CVA)

Model	R <sup>2</sup>	D-W	P-Value,F
4	.139	1.608	.000
4a	.177	1.702	.000
4b	.203	1.741	.000
4c	.139	1.608	.000

**8. General conclusions**

Table (10): the results of statistical analysis of the coefficients of the independent variables of the Fourth hypothesis CVA

Model	Variable	β	t	P-value
4	EVAIC	.000	.337	.736
	Size	.008	2.015	.044
	Lev	-.238	-10.7	.000
4a	EVACA	.189	5.731	.000
	Size	.008	2.160	.031
	Lev	-.237	-10.9	.000
4b	EVAHU	.017	7.571	.000
	Size	.004	1.155	.249
	Lev	-.220	-10.2	.000
4c	STEVA	.000	.260	.795
	Size	.008	2.014	.044
	Lev	-.238	-10.7	.000

Today knowledge has changed to be the most important capital and it is an alternative for physical capitals especially in competitive and technological environments. Thus, the concept of intellectual capital has gained important and broad applications. Intellectual capital is realized in customers, processes, information, trade mark, human resources and organizational systems and has a considerable role in creating consistent competitive advantages. In the present research and regarding the importance of intellectual capital in creating value for the company and stockholders, we have studied the effect of the coefficient of intellectual capital's economic value added on the performance measures based on firms' value added. The results of the

hypotheses test approved the positive and meaningful effect of economic value added coefficient (intellectual capital and capital utilized and human capital) on performance measures of MVA, EVA, and CVA.

Unlike the theoretical framework of the present research only the positive and meaningful effect of economic value added coefficient of the capital utilized (EVACA) on CSV (value added created for stockholders) was approved.

Also the effect of STEVA was not approved in any of the hypotheses tests. Thus, changing the structural assets into physical assets (utilized) and human assets along with changing into economic value added, resulted in increasing the value added created for the stockholders and companies.

The notable thing in cases where the hypotheses are approved is that the independent variables have had a positive effect on the dependent variables.

#### Corresponding Author:

Peyman Imanzadeh

Islamic Azad University, Talesh branch, Talesh, Iran

[pi\\_imanzade@yahoo.com](mailto:pi_imanzade@yahoo.com)

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