

The effect of intellectual capital on the criteria of value creation in listed companies Tehran Stock ExchangeDr. Saeid Jabbarzadeh Kangarlouei¹, Yaghoob Pourkarim², Vali Pourkarim³¹Department of Accounting, Islamic Azad University, Orumieh Branch, Orumieh IranE-mail: Jabbarzadeh.s@gmail.com²Department of Accounting, Islamic Azad University, Khosrovshahr Branch, Khosrovshahr IranPourkarim.y@gmail.com³Department of Accounting, Islamic Azad University, Heris Branch, Heris IranPourkarimv@yahoo.com

Abstract: The aim of this study was to evaluate the effect of intellectual capital on firm value creation criteria listed companies Tehran Stock Exchange in the period 2008-2014. In this research, use the intellectual capital Pulic model (2000), and the firm value creation criteria are also using economic value added, market value added, and economic value has been calculated. To test hypotheses and estimate the effects of variables, panel data techniques in a way ordinary least squares (OLS) is used. The results show that the coefficient value added intellectual capital has a positive impact on value creation criteria (economic value added, market value added and Adjusted Economic Value Added).

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Keywords: intellectual capital, value creation, economic value added, market value added, EVA adjusted.

1. Introduction

One of the distinctive features of a knowledge-based economy, the enormous investment in human capital and information and communication technology. Because it enhances the understanding and use of intellectual capital to help companies more efficient, more effective, more efficient and more innovative. In addition, the Company's competitive position will depend to a greater extent in the strategic management of intellectual capital. Intellectual capital, not only in itself an intangible asset is static, but rather a process of ideological and is considered a means to an end (Namazi and Ibrahim, 2009). In the meantime, the role of intellectual capital, a fact that can not be indifferent to it. Neglect in this area can be irreparable damage on the import of capital market indices. Because the intellectual capital of the economic environment in the country. Many scholars even believe that the main cause of backwardness of some countries is the lack of intellectual capital for productive activities and not lack of capital resources.

Performance evaluation of the most important topics of interest to investors, creditors, managers and government. In practice, there are different criteria for evaluating performance. To select the appropriate benchmark, it is necessary to consider the company's strategic goals (Jahankhani and zarif fard, 1995). The criteria guidelines for evaluating the performance of business units to provide managers and capital market entities that can benefit evaluation, value added based economic model. Value-based performance and survival of any kind of market, there is a strong

relationship that the capital market is also very important since it is not innocent. Meanwhile, the index of economic value added, market value added and adjusted economic value is very important. (Stewart, 1991).

on the other hand, the company aims to create value and wealth creation for shareholders and create value not only for investors, but for those who manage the company Is also of great importance and because there are organizations that create value for its members that they alone cannot create it And also on the other hand, the business world today, the field of knowledge-based organizations, and in this economy, factors such as revenue, profitability and physical assets, only a small part of the success of the organization and reflects the true wealth of organizations attract intangible assets and intellectual capital given the importance of this issue is therefore, in this study, the effect of intellectual capital value creation metrics discussed.

So far, several studies on the impact of intellectual capital on firm performance evaluation criteria was conducted. But given the fact that in none of them, together with the inclusion criteria for value creation as a general indicator of economic value added, market value added, and economic value adjustment has not been studied, So in this article, the impact of intellectual capital on simultaneous value creation criteria, taking into account all the above criteria and using panel data methods are discussed.

Anyway, with respect to the items above, this research seeks to answer the questions that include:

1. Does intellectual capital standards affect value?

2. Which one of the components of intellectual capital, has the greatest impact on value creation criteria?

2. Theoretical Foundations

Biyun, and Dong ping (2015), explores the relationship between intellectual capital and firm performance in China's bio-pharmaceutical industry and based on the results, the bio-pharmaceutical industry, intellectual capital and firm performance relationship Significant, but the correlation is weaker physical capital. Human capital and structural capital are significantly positive relationship with firm performance. Customer capital and firm performance are positively related, but non-significant impact on each other and the different components of intellectual capital and company performance affect each other.

Survilaite et. al (2015) examined the intellectual capital in modern management approach with the prospect of a company's value. Following a literature review on value creation and management, the authors, the cross section model for value creation through intermediaries established that the three main elements of added value (human capital, structural capital and customer capital) shows.

Shakila and Barajas (2014), explores the creation of value through intellectual capital in the developed markets of Europe and aimed at studying the function of generating companies based on the use of funds was done mentally. The findings show that the program allows the Cob-Douglas production function design based on intellectual capital and intellectual capital components complement the results obtained in this study justified. Increasing returns to scale intellectual capital in this study was observed in the samples.

Riahi Belkaoui (2003), the study examines the impact of intellectual capital on performance within the time period from 1992 to 1996, is an American multinational corporations. He has 100 manufacturing and service company American multinational population and the sample was 81 companies that research in the years studied data required have been provided. In this regard, he "number of requests symptoms of trade protection" by next contestant during a ten-year period as a measure of intellectual capital "ratio of value added to total assets" to be considered as a measure of company performance. The results, he suggests that, between the American multinationals intellectual capital and there is a significant positive relationship.

2. Methods

2.1. Research hypotheses

1. There is a significant relationship between intellectual capital and economic value added.

2. there is a significant relationship between intellectual capital and value added market.

3. there is a significant relationship between intellectual capital and adjusted economic value added.

2-1.1. Subsidiary Hypotheses:

1. there is a significant relationship between human capital, structural capital and physical capital and financial with economic value added.

2 there is a significant relationship between human capital, structural capital and physical capital and financial with market value added.

3. there is a significant relationship between human capital, structural capital and physical capital and financial with adjusted economic value added.

2.2. variables

2.2.1. Independent variables

Measures of economic value added

In this study, based on the model provided by Stewart (1991), Economic Value Added is obtained as follows:

$$EVA_t = (NOPAT_t - r_t \cdot Capital_{t-1}) / WANS_t \quad (1)$$

EVA_t : economic value per share at the end of t, $NOPAT_t$: operating profit after tax at the end of t, r_t : WACC in year t, $Capital_{t-1}$: the amount of capital at the end of last year t-1, $WANS_t$: weighted average number of shares at the end of the year t.

WACC obtained using the following formula:

$$WACC = (K_s \times W_s) + [W_d \times K_d(1-t)]$$

W_s and W_d : the weight of equity and debt divided by equity book value of common shareholders' equity and liabilities obtained by the sum of the two weights each.

K_s and K_d : the ordinary and the rate of cost of equity is the rate of cost of debt. Normal rate of cost of equity (K_s) of cash dividends paid to shareholders on the company's book value of equity is obtained. Rate cost of debt (K_d) of the division of corporate finance costs on interest-bearing liabilities obtained (Jabbarzadeh and Bashiri, 2014).

Measures of market value added

Market value added is calculated as follows:

$MVA = \text{Market Value of Equity} - \text{book value of equity}$

Measures of economic value added adjusted

In this measure, the total market value of equity and book value of long-term debt at the start of the company's cost of equity capital. It is calculated as follows:

$EVA \text{ adjusted} = (\text{rate of return investments} - \text{the rate of cost of capital}) \times \text{value of capital market}$

2.2.2. Dependent variable Intellectual Capital

To measure intellectual capital, Pulic's model (2000) was used. Pulic model with 5 stages are as follows:

First step: determine the value added (VA)

$$VA = \text{OUTPUT} - \text{INPUT}$$

OUTPUT: The total proceeds from the sale of goods and services, and INPUT: the total cost of materials, components and services are purchased.

According to this view every person or group of events affected entity, you must have an interest in the entity. This group of stakeholders, including shareholders, employees, funders, government and society. Therefore, performance measurement, such as value-added criterion stakeholders, better earnings, which only indicates the return on shareholders (Maditinos et al., 2011). Therefore, the calculated value can be expressed according to the following equation:

$$VA = W + I + T + NI$$

W: salary employees, I: Interest, T: tax and NI: profit after deduction tax.

Second step, determine the efficiency of capital employed (physical and financial)

$$VACA = VA / CE$$

VACA: the efficiency of capital employed, and CE: Capital Employed equal to the book value of the company's total assets minus intangible assets it.

Third Step, determine the efficiency of human capital

According to this model, all the staff costs are considered as human capital.

$$VAHU = VA / HU$$

VAHU: human capital efficiency, and HU: human capital, which is now equal to the total salary cost.

Four Step: Determine the structural capital efficiency

$$STVA = SC / VA$$

$$SC = VA - HU$$

STVA: structural capital efficiency, SC: Capital structure of the company.

Five Step: Determine the value added coefficient of intellectual capital

$$VAIC = VACA + VAHU + STVA$$

Note that the model Pulic, customer capital is not intended to be (Talebniya et al., 2012).

2.3. sampling

The main objective of this study was to evaluate the effect of intellectual capital on the criteria of value, so the purpose of the present study was to research applications And in terms of research methodology Correlation - Cause after the is. The study population consisted of all companies listed on the Tehran Stock

Exchange. The systematic deletion method selected for sample selection and the following conditions are considered:

1. financial year ending in March, and there is no Change in the period under evaluation.
2. Companies should not have more than three consecutive months are transactional interruption.
3. the information needed to carry out research on the period presented is complete.
4. companies that have not negative equity and not loss.
5. before 2008 are listed in the Tehran Stock Exchange.
- 6) are not investment companies (Holding) and financial intermediation.

2.4. Research Models

After applying the above criteria, 64 companies in the study sample and the period of 2008-2014 years and consisted of a total of 448 years of the company.

In order to collect information on explaining the research literature, the library method and documentary studies used And in order to obtain the information required to process the hypotheses, the information contained in enterprise software, new achievements and assess the financial statements of companies At this stage, after collecting the statistical data, conclusions and calculations required to use Excel software And to test the hypotheses, panel data techniques to ordinary least squares method is used EVIEWS software.

Also, models investigated by the Pulic model are as follows:

$$EVA_{it} = \beta_0 + \beta_1 VAIC_{it} + \varepsilon_{it} \quad (1)$$

$$MVA = \beta_0 + \beta_1 VAIC_{it} + \varepsilon_{it} \quad (2)$$

$$REVA_{it} = \beta_0 + \beta_1 VAIC_{it} + \varepsilon_{it} \quad (3)$$

$$EVA_{it} = \beta_0 + \beta_1 HC_{it} + \beta_2 SC_{it} + \beta_3 CC_{it} + \varepsilon_{it} \quad (4)$$

$$MVA_{it} = \beta_0 + \beta_1 HC_{it} + \beta_2 SC_{it} + \beta_3 CC_{it} + \varepsilon_{it} \quad (5)$$

$$REVA_{it} = \beta_0 + \beta_1 HC_{it} + \beta_2 SC_{it} + \beta_3 CC_{it} + \varepsilon_{it} \quad (6)$$

In the above model, EVA: Economic Value Added represents, MVA: represents the market value, REVA: confirms the value of adjusted EVA, VAIC: represents the value added coefficient of intellectual capital, HC: represents human capital, SC: represents the structural funds, CC : represents the physical and financial capital, and ε : represents the random error term.

3. Results

To check the normality of variables Kolmogorov-Smirnov test was used. As the results of Table 1 suggests, achieved significant levels (greater than 5%) indicates that the distribution is normal Mqadyrhay dependent variables and hence can be regression equations (1) to (6) to the relationship

between intellectual capital and value creation criteria used.

Table 1: Test results to determine the normal distribution of the dependent variable values

significance level	Variable
0/0846	EVA
0/0675	MVA
0/0791	REVA

3.1. Check the linearity between variables

Table 2: Results of linear relationship between independent and dependent variables in the equation (1) to (3)

(1)		
Variable	EVA	VAIC
EVA	1/0000	0/0549
VAIC	0/0549	1/0000
(2)		
Variable	MVA	VAIC
MVA	1/0000	0/0265
VAIC	0/0265	1/0000
(3)		
Variable	REVA	VAIC
REVA	1/0000	0/0478
VAIC	0/0478	1/0000

Table 3: results of the linear relationship between independent and dependent variables in the equation (4) to (6)

(4)				
Variable	EVA	SC	HC	CC
EVA	1/0000	0/0254	0/0437	0/0568
SC	0/0254	1/0000	0/0178	0/0366
HC	0/0437	0/0178	1/0000	0/0233
CC	0/0568	0/0366	0/0233	1/0000
(5)				
Variable	MVA	SC	HC	CC
MVA	1/0000	0/0533	0/0233	0/0678
SC	0/0533	1/0000	0/0178	0/0366
HC	0/0233	0/0178	1/0000	0/0233
CC	0/0678	0/0366	0/0233	1/0000
(6)				
Variable	REVA	SC	HC	CC
REVA	1/0000	0/0531	0/2287	0/1198
SC	0/0531	1/0000	0/0178	0/0366
HC	0/2287	0/0178	1/0000	0/0233
CC	0/1198	0/0366	0/0233	1/0000

To examine the line between independent and dependent variables, we have formed the corresponding diagonal matrix. Since the results tables

(2) and (3) suggests, because all elements outside the main diagonal matrix lower than 9.0 are to the respective model, there is no linear relationship and therefore continues to estimation of the models studied.

3.2. The results of model (1) to (3)

Results Table (4) in all companies surveyed, rejects the hypothesis that the width of the source and origin of different width must be considered in the estimate. The result can be used to estimate panel method.

Table (4): F Limer test results for equations (1) to (3)

Effects test	Test	Degrees of freedom	significance level
(1)			
Section F-Cross	27/5735	(63*310)	0/0000
Cross-section Chi-square	9563/364	63	0/0000
(2)			
Section F-Cross	7921/22	(63*310)	0/0000
Cross-section Chi-square	1845/472	63	0/0000
(3)			
Section F-Cross	9346/21	(63*310)	0/0000
Cross-section Chi-square	6705/437	63	0/0000

However, to determine the type of estimation method with respect to fixed or random effects Hausman test should be examined. Hausman test results in the table (5), H0 hypothesis that the adaptation of the companies do not exclude random effect estimates and estimates must be made using random effects.

Table 5: Hausman test results for equations (1) to (3)

Effects test	Test	Degrees of freedom	significance level
(1)			
Cross-section random	1346/4	1	0/1079
(2)			
Cross-section random	1734/2	1	0/1206
(3)			
Cross-section random	1123/2	1	0/1336

Finally, the results of model (1) to (3) in the table (6) and shows; rate of value added intellectual capital have a positive impact on economic value added, market value added, and economic value and is adjusted there is a significant level. Therefore, the main hypothesis first, second and third this study are confirmed.

Table (6): Results of model (1) to (3)

Variable	Factor	t Statistics	significance level
(1)			
C	2/3356	25/8126	0/0011
VAIC	8/4425	4/2656	0/0098
(2)			
C	2/4023	56/1487	0/0009
VAIC	1/1689	3/7745	0/0041
(3)			
C	2/3756	43/4560	0/0000
VAIC	1/1578	4/6654	0/0008

3.3. The results of model (4) to (6)

Based on the results table (7) in all companies surveyed, rejects the hypothesis that the width of the source and origin of different width must be considered in the estimate. As a result, the method can be used to estimate panels.

Table (7): F Limer test results for equations (4) to (6)

Effects test	Test	Degrees of freedom	significance level
(4)			
Section F-Cross	27/4423	(63.308)	0/0000
Cross-section Chi-square	427/1298	63	0/0000
(5)			
Section F-Cross	15/2216	(63.308)	0/0000
Cross-section Chi-square	9856/578	63	0/0000
(6)			
Section F-Cross	1123/14	(63.308)	0/0000
Cross-section Chi-square	6513/432	63	0/0000

However, to determine the type of estimation method with respect to fixed or random effects Hausman test should be examined. Hausman test results in the table (8), H₀ hypothesis that the adaptation of the companies do not exclude random

effect estimates and estimates must be made using random effects.

Finally, the results of model (4) to (6) in the table (9) and offered shows, human capital has a positive impact on economic value added, market value added and adjusted economic value added and at the level of one percent are meaningful. Structural capital also had a positive impact on economic value added, market value added, and economic value is modified in a significant percentage of their level. Physical and financial capital also had a positive impact on economic value added, market value added, and economic value is modified in a significant percentage of their level. Also, the impact factor of human capital than physical capital and financial structure, and more. So, hypotheses first, second and third this study are approved.

Table (8): Hausman test results for equations (4) to (6)

Effects test	Test	Degrees of freedom	significance level
(4)			
Cross-section random	5432/10	3	0/1745
(5)			
Cross-section random	1325/12	3	0/1389
(6)			
Cross-section random	9/7256	3	0/1289

Table (9): Results of model (4) to (6)

Variable	Factor	t Statistics	significance level
(4)			
C	2/5568	87/1256	0/0000
CC	0/2798	4/8233	0/0000
HC	4/6645	4/1345	0/0001
SC	0/0945	2/6343	0/0003
(5)			
C	2/5543	0/8023	0/0000
CC	0/3689	2/9078	0/0009
HC	4/1789	7/0431	0/0011
SC	1/8334	2/8532	0/0002
(6)			
C	2/6578	99/1456	0/0000
CC	0/1289	3/6234	0/0001
HC	4/6543	4/8623	0/0023
SC	0/2789	2/9143	0/0000

4. Conclusion and Discussions

The purpose of this paper is to examine the impact of intellectual capital on value creation criteria and the results of the estimates, indicate that the value added coefficient of intellectual capital has a positive impact on economic value added, market value added, and economic value is modified. For a more detailed study of the impact of the sub-components of intellectual capital (human capital, physical capital and financial and capital structure) on the criteria value was determined on the basis of the results, human capital, physical capital and financial and structural capital has a positive impact on merit performance and highest impact factor is also related to the human capital component.

The results show that research findings consistent with the findings of external studies such as Biyun, and Dong ping (2015), Abdul (2013) and Riahi Belkaoui (2003). Also, the results indicate that the majority of research findings consistent with the findings of internal investigations, and the differences can also be seen.

Comments result of the research findings include:

1. It is recommended that the Stock Exchange in this regard hold seminars and training classes. When brokers are also offering consulting services about the situation in the company's intellectual capital and its impact on the competitiveness and profitability of the necessary material expression.

2. According to the research findings and the relationship between intellectual capital and value creation criteria, can be offered to investors and other users of information in order to make investment decisions on economic criteria such as economic value added, market value added and place great importance on adjusted economic value added.

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