The Investigation of the Effect of Intellectual Capital on the Investor's Return of Investment in the Tehran's Stock Exchange: A Case Study of Industrial Chemical

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Abstract

The purpose of this study was to investigation the impact of intellectual capital on capital gains of investors in the chemical industry in Tehran stock exchange. However, the model used in the present study was Pulic model (1998). This model examines the relationship between intellectual capital based on his trilogy of the human capital, structural capital, and relational capital with capital gains and the investors of the companies related to the chemical industry in Tehran stock exchange. The total value of this model is stated according to efficiency coefficient value ($VAIC_{it}$), and total resources of the firm. The scope of the study is, between the years 2004-2011. The present Study is based on a survey of analytical–descriptive method which in a functional form studies the relationship between intellectual capital and capital gains, the investors of the companies related to the chemical industry in Tehran stock exchange. But it is worth noting that in this study data are analyzed using Pulic model and (SPSS) Software and multiple regression. In the present study, data are collected using internet and information networks and referring to books, journals and dissertations and review of literature and achieving the overall structure and for testing the hypotheses, the list of data of accepted companies in Tehran stock exchange and Through the application of various software and websites related to Tehran stock exchange. Data were collected by referring and viewing financial statements and also for testing the hypotheses, the data of the accepted companies in Tehran stock exchange Through the application of Rah avarde novin software were used and also using data collection method and viewing financial statements. This study shows a significant relationship between the independent variables, The model of intellectual capital (human capital, structural capital, relational capital), and the dependent variable as capital gains for investors active in the chemical industry in the Tehran Stock Exchange which its results in significance level less than 5% (the null hypothesis) and confidence level of 95% are confirmed.

Key words: Intellectual capital, communications capital, human capital, structural capital, capital gains, Tehran Stock Exchange.

1. Introduction

The developments of the present century, the momentum of all the traditional approaches to the management of the organization as subject to the rules of classical management dismissed and disassemble, can be injected into the history of modern concepts of management science. Nowadays, the source of value creation of the apparent reversal of capital is exogenous to shift inward investment.

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The human capital and social capital, such a wealth of hidden (non-visible), (Tavasooli, G.A., Ghaderi,H.,N.A.,2003), Are leading to the production of corporate knowledge and the traditional methods of value creation like physical capital and physical labor, has lost its last position.

One of the scientists named Gratton, L. and Ghoshal S. Management (Gratton, L. and Ghoshal S., 2003), to map these new conditions uses the metaphor of a democratic revolution in workplaces.

The According to him belive, concept of democresy of organization create to area of multi principle basic:

1-The create of condition that that in to on people can be telling of potentional ability and her self to different qualities.**2-**To support of the use of authoritation of power,**3-**Itreaction of people to determining of condition relationships with organization and exactly to development of oppurtunities for acceses to value resource.

The one of the factors effect in this one are imtngalible assets of company that is not report to statement and financial number (or performance finance).

And in this recent the formed of as a important part or section of assests ever lead compony. The model of Pulic model (1998), is as a feames model for transfer of numbering (calculation) of this intanglible factors, that was classification to third factor: 1-Human Capital, 2-Structural Capital, 3-Capital Employed. The intellectual capital with notion to development the like invirinment of rule and low, the expensive use of conection technology and information, rise of innovation shall be considered as a main important for reach or achivment advantage competitive cosistant and the effecting on to area of strategic, as circle (Axis) of activities of long term in organization to dimension of 1-Human Capital, 2-Structural capital, 3-capital employed (Hagi karimi, A., Bathayei, A.,1388).

Hence, organizations are to being of incorporated at economic on the knowledge. The at economic that in which knowledge and intangible assests recojnation as a important advantage competitive of organization.

1.2. Statement of problem

The age of recent (present age) with economic growth based on knowledge or based-knoledge, intangible assets of company and intelectuall capital are the key element to for achivment the consistant advantage competitive (Teece, 2000).

And why the various items of intangible areas such as economics, accounting and strategic management has grown rapidly. Knowledge is a competitive advantage in business strategy, that will be considered in organizations (Krgh and Roos, 1996). The goal is to create knowledge that will lead to continuous innovation and continuous innovation to create competitive advantage (Nonaka, 1995).

Nowadays, organizations to improve business performance and ensure the success and sustainability are forced to consider knowledge management (Sveiby.,1997).

Also, the intellectual capital in innovation, productivity, growth, business competitiveness and economic performance is crucial and increasingly important (Lim, Lunn L.K. & Dallimore, Peter, 2004: 192). This will be increase the chances of an asset (Sudarsanam, Sudi & Sorar, Ghulam & Marr, Bernard, 2006, p 306)

Nowadays organizations to improve business performance and ensure the success and sustainability are forced to focus on knowledge management (Sveiby,karl–Erik,1997).

And it is necessary to strengthen the human resource potential and capacity, to show their organizations to achieve competitive advantage through continuous performance improvement, fast response to changes in the business environment and economic conditions (Macdonald, 2000).

One of the major challenges for managers is the potential application of knowledge and intellectual capital of the company to create value and in this sense, managers must design functions that can use their knowledge to create value labor.

The traditional accounting method is to significantly contribute to the realization of business value. However, in a knowledge-based organization, where knowledge of the value of a product and makes up a large part of the wealth of an organization. Traditional accounting methods, which are based on tangible assets as well as information relating to the operations of the organization are insufficient to value intellectual capital, is the largest and most valuable asset for many organizations (Sulivan, Patrick H, 2000).

The Measuring intellectual capital perspective, the focus is on how to create new mechanisms for measuring, reporting, non-financial or qualitative variables of intellectual capital in the traditional data, quantitative or financial. Compared with traditional financial accounting, intellectual capital measure includes important issues such as human capital, customer satisfaction and innovation. Therefore, a more comprehensive approach to intellectual capital for organizations those want to be aware of the value of their performance.

There are significant differences between the two approaches

While financial accounting is oriented to the past, is Intellectual Capital Measurement prospective. Measuring intellectual capital includes soft facts (quality), while the hard reality that financial accounting measures (quantity). Measuring Intellectual Capital is focused on creating value, while financial accounting which reflects the efficiency of operations and cash flows.

Since that intellectual capital is the difference between market value and book value of assets, as a puts the organization (Seetharaman,A et al,2002,pp:148-128).

Therefore, in this study we sought to answer the fundamental question, whether the components of intellectual capital has an impact on the interest rate on capital gains to investors chemical industries operating in the Tehran Stock Exchange (TSE)? If the answer is positive, it is also influenced by how much?

2 -The Review of the Theoretical and Background of the Research

2-1-Definition and concept of capital gains (capital gains)

MR_{it}=Investors' capital gain on shares of firm 'i' during the 't' period. Ca pital gain on shares is only dependent variable in the equation. Capital gain on shares can be calculated using the following equation.

Where,

$$MR_{it} = \frac{P_{t1} - P_{t0}}{P_{t0}} \times 100$$

P_{t1}=Market Price per share of firm i at the end of the period t. And P_{t0}= Market Price per share of firm i at the beginning of period t.

2.2. Intellectual Capita

In most evaluations, are considered tangible assets of the company; And intangible assets such as intellectual capital can be neglected,Intellectual capital is divided into three parts: human capital, structural capital and relational capital., But as a theory focuses on the value of intellectual capital,And provides the basis for calculating value added. While financial accounting reflects the efficiency of operations and cash flows.

Sveiby, karl–Erik (1997),was the first person in 1997 to divide intellectual capital into three broad areas as follows:

1-human capital-in the field of personal fitness. 2-Capital structure-in the field of internal structure.3-Capital Connection (customer capital)-the area of the outer structure (Sveiby,Karl–Erik.,1997).
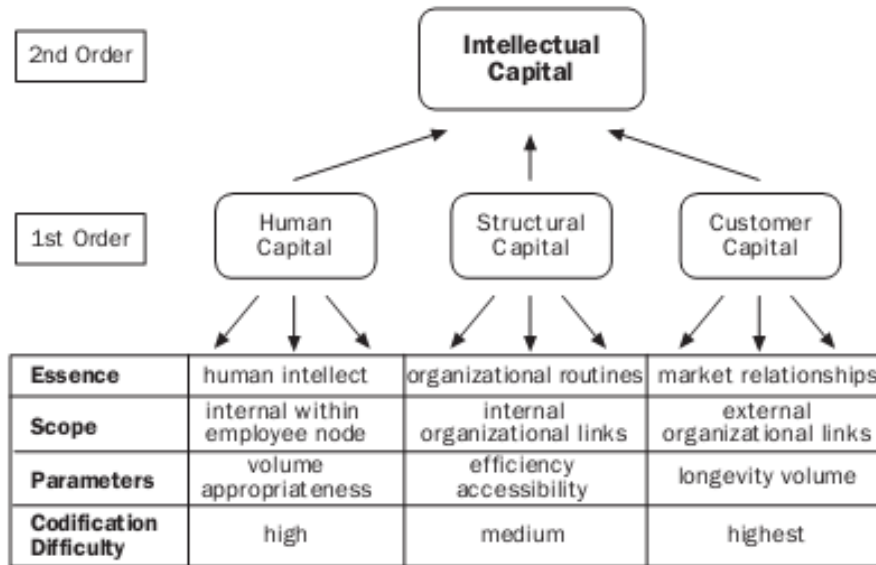
Figure 1: Conceptualization of intellectual capital
(**Reference:** Bontis,Nick(1998),intellectual capital: an explanatory study that develops measures and models , management desion,36(2),pp:63-76.)

2.2.1. The value added intellectual coefficient (VAICT) Method

The value added intellectual coefficient (VAIC^{TM}) as a measure of firm intellectual capital was found by Pulic (1998).Boremann Manfred (1999) developed it further to comply with additional variables. The VAIC$_i$ method is based on financial statements of a firm in order to calculate the efficiency coefficients for thre e types of capital. Though VAIC$_i$ uses accounting data, it does not focus on the cost of the firm. It does focus on the efficiency of resources that create values to the firm (Pulic 2000, Boremann 1999). Thus, firm managers can use VAIC$_i$ to monitor and evaluate firms' assets and, accordingly, develop business strategies in order to achieve competitive advantages. VAIC$_i$ of a firm (i) can be calculated using the following five steps (Ranjith Appuhami, B.A., 2007, pp:14-25):

The formulation of intellectual capital indicators ((VAICi) the following algebraic expression:

$$VAIC_i = CEE_i + HCE_i + SCE_i$$

> ***In which:***

- ***VAIC$_i$)): is the efficiency factor for a company's intellectual capital (i),.***
- ***(CEE$_i$): is the efficiency coefficient of investments related to the Company (i),((CEi:is the book value of the net assets of company i).***
- ***(HCE$_i$): is a coefficient of efficiency of human capital for the Company (i),***
- ***(SCE$_i$): is the efficiency factor for a company's capital structure (i),***

$$CEE_i = \frac{VAi}{CEi}$$

HCE$_i$: is the coefficient of human capital for company i.(Hci: is the total outlay for wages, the company $_i$).

$$HCE_i = \frac{VAi}{HCi}$$

SCE$_i$: is the ratio of capital structure for the company i. (Sc$_i$: is the capital structure, the Company i).

$$SCE_i = \frac{SCi}{VAi}, \qquad SC_i = VA_i - HC_i$$

Pulic (1998) stating that the condition factor (VAIC_i), high performance best value by the total resources.

2-Independent Variables: Human Capital, Structural Capital, Relational Capital

Intellectual capital elements (model Pulic) or (VAIC_i), is measured using the following model:

$$VAIC_i = CEE_i + HCE_i + SCE_i$$

In which:

- *VAIC_i)): is the efficiency factor for a company's intellectual capital (i),.*
- *(CEE_i): is the efficiency coefficient of investments related to the Company (i),*
- *(HCE_i): is a coefficient of efficiency of human capital for the Company (i),*
- *(SCE_i): is the efficiency factor for a company's capital structure (i),*
  Pulic (1998), stated that the situation of intellectual capital efficiency coefficient VAIC_i)) is higher than the effectiveness of the total value added by the company's resources. However, the first step is to determine the overall value of the company is calculated CEE_i, HCE_i and SCE_i.

2.4. Empirical Research Background

In this section of current study, the expression of some of the research conducted by researchers associated with research, or pay to do some of the research on intellectual capital theory and capital markets, economy and area of business:

Table 1:The Summary of Results of Research Conducted on Intellectual Capital and Stock Market

Rank	Name of Researcher	Title of Research	Year of study	The Results of Research
1	Bontis , Nick	intellectual capital: an explanatory study that develops measures and models, management desion	1998	The results showed a strong and direct relationship between the amount of investment in intellectual capital and performance indicators of the business.
2	Bernnan ,N.and Connel, B	intellectual capital :current issues and policy implications , journal of intellectual capital	2000	The results of twenty to thirty percent is intellectual capital on business performance of enterprises.
3	Bontis , Nick	national intellectual capital index: an united nations intiative for the arab region	2004	This research has used three components of human capital and structural capital, relational capital as components of intellectual capital this act was met with a lot of administrative problems.
4	Sofia, Saudan	the implication of	2006	The results show that the

	, Tayles ,Mik , Pike , Richard	intellectual capital on performance measurement and coporate performance		components of intellectual capital and its effects on firm performance has been positive results.
5	Cabrita , maria do Rosario , Landeiro Vaz ,Jorge	intellectual capital and value creation : evidence from the Portuguese banking industry	2006	The results of Nash's intellectual capital on organizational performance (including human, structural and relational).
6	Selemi , Ahmed , Ashour , Ahmed , Bontis , nick	, Human capital and organization performance : an study of Eguption sowftware companies	2006	The results showed that provides a clear picture of human capital and human capital as well as the evaluation matrix.
7	Appuhami ,Ranjith	the impact of intellectual capital on investors capital gain on shares : an empirical investigation in the thai banking finance and insurance sector	2007	The results obtained confirm the existence of a positive relationship between capital investment and equity components of intellectual capital efficiency model to by Pulic (1998).
8	Salleh ,Abdal Latif ,Selamat , Fauziah	capital management in Malaysian public listed companys	2007	The results showed that there. Significant differences between the types and sizes and in different industries and implemented knowledge management, intellectual capital in their business model.
9	Puntilo, P,	intellectual capital and business performance : evidence from Italian banking industry	2009	The results indicate that there is a significant positive relationship between intellectual capital and firm performance.
10	Zou , Xiaopeang , Huan , Tzung–cheng.,	Astudy of the intellectual capitals impact on listed banks performance in china	2011	The results showed that, among Chinese banks, structural and physical assets, is positively correlated with technical efficiency, but has a negative correlation with structural capital.

Source: research findings.

3. Research Methodology
3.1. Methods of Reseasrch

The methods of the current study is based on an analytical study- descriptive,That, as applied to the study of the correlation between intellectual capital and capital gains, investors related companies in Tehran Stock Exchange (TSE), for the chemical industry. But it is worth noting that in this study, the use of models and intellectual capital efficiency model to by Pulic

(1998) and software (SPSS), and analysis of variance table (ANOVA), have been analyzed data.

3.2. Data Collection Methods

In the present study, data collection methods, the research has been done using the Internet and information networks and refer to books, journals and dissertations collection to achieve the overall structure of the research literature. Also the present study has attempted to test the hypothesis, using of the observed data of listed companies in Tehran Stock Exchange (TSE), through the application of various websites including Tehran Stock Exchange, The data and methods, and to see the financial statements have been collected. Also, the action is to test hypotheses using data views companies listed in Tehran Stock Exchange for the Rhavarde Novin(3) Software. And research data has been collected using a lookup and see the financial statements.

3.3. Extraction of Model Study of Literature

This study is an investigation of the cross - correlation,Which deals with the application of intellectual capital related to capital gains of Investors to companies in Tehran Stock Exchange for the chemical industry.

3.3.1. The Conceptual model of Research

The following section will describe how to measure each of these variables:

Intellectual capital elements of the model are defined and measured. Thus, the formulation of intellectual capital indicators (VAIC) is an algebraic expression below:

$$VAIC_i = CEE_i + HCE_i + SCE_i$$

In which:

- *VAIC$_i$)): is the efficiency factor for a company's intellectual capital (i),.*
- *(CEE$_i$): is the efficiency coefficient of investments related to the Company (i),*
- *(HCE$_i$): is a coefficient of efficiency of human capital for the Company (i),*
- *(SCE$_i$): is the efficiency factor for a company's capital structure (i),*
  Pulic (1998), stated that the situation of intellectual capital efficiency coefficient VAICi)) is higher than the effectiveness of the total value added by the company's resources.
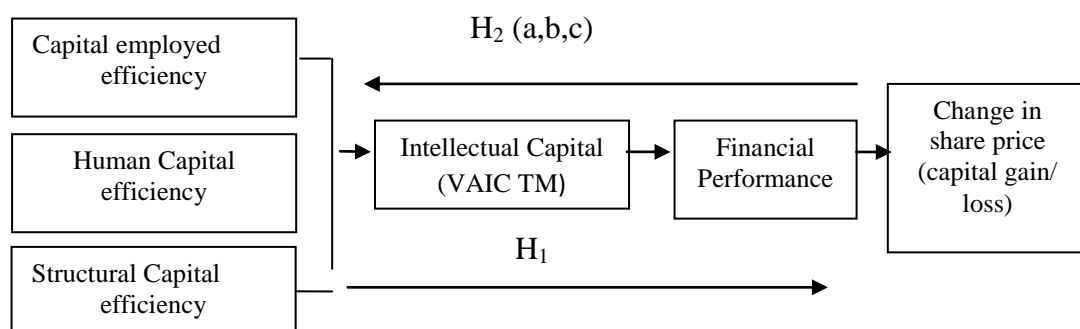

Figure 2:The Conceptual model of Research

3.3.2. The study Variables and Measured Variables

1-Dependent Variable: an Idicator of Capital Gains

Method of calculating the index (Capital Gains), as one of the most profitable investment indices based on financial figures are as follows:

A model of profit or Capital Gains for each firm is calculated as follows:
With the use of multivariate linear regression model, the relationship between capital gains which is calculated on a per-share investors, through the following equation:

$$MR_{it} = \alpha_0 + \alpha_1 \ VAIC_{it} + \alpha_2 \ VAHC_{it} + \alpha_3 \ VACA_{it} + \alpha_4 \ STVA_{it} + \varepsilon_{it}$$

Also, capital gains are calculated by the following equation investors during the period:
Where,

$$MR_{it} = \frac{P_{t1} - P_{t0}}{P_{t0}} \times 100$$

In which:
P_{t1}=Market Price per share of firm i at the end of the period t. And P_{t0}= Market Price per share of firm i at the beginning of period t.
Also, the formulation of intellectual capital indicators (($VAIC_i$) the following algebraic expression:
$$VAIC_i = CEE_i + HCE_i + SCE_i$$

    In which:
- ***$VAIC_i$)): is the efficiency factor for a company's intellectual capital (i),.***
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- ***(HCE_i): is a coefficient of efficiency of human capital for the Company (i),***
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$$CEE_i = \frac{VAi}{CEi}$$

HCE_i: *is the coefficient of human capital for company i.(**Hc_i:** is the total outlay for wages, the company i).*

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SCE_i: *is the ratio of capital structure for the company i. (**Sc_i:** is the capital structure, the Company i).*

$$SCE_i = \frac{SCi}{VAi} \quad , \quad SC_i = VA_i - HC_i$$

Pulic (1998) stating that the condition factor ($VAIC_i$), high performance best value by the total resources.

2-Independent Variables: Human Capital, Structural Capital, Relational Capital
Intellectual capital elements (model Pulic) or ($VAIC_i$), is measured using the following model:

$$VAIC_i = CEE_i + HCE_i + SCE_i$$

In which:
- *$VAIC_i$)): is the efficiency factor for a company's intellectual capital (i),.*
- *(CEE_i): is the efficiency coefficient of investments related to the Company (i),*
- *(HCE_i): is a coefficient of efficiency of human capital for the company (i),*
- *(SCE_i): is the efficiency factor for a company's capital structure (i),*
  Pulic (1998), stated that the situation of intellectual capital efficiency coefficient $VAIC_i$)) is higher than the effectiveness of the total value added by

the company's resources. However, the first step is to determine the overall value of the company is calculated CEE_i, HCE_i and SCE_i.

4. Data Analysis

4.1. Description of the Data

In this section is presented, the statistical properties of time series of returns or capital gains rate and the coefficient of performance variables of intellectual capital (human capital, structural capital, physical capital) are shares of companies in the chemical industry. These features include, skewness, strain, mean, etc. The number of observations for each time series.

Table 2:Description of the data variables in the period 2004-2011.

	N	Range	Minimum	Maximum	Mean	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
CEE_i	70	3333870.884	-4909.884	3328961	108294.713586	60000.171
HCE_i	71	1000.93241	-88.40761	912.5248	63.1580428159	20.65884
SCE_i	71	5.3813E8	-1790475.7202	5.3634E8	69472510.7261	20914947.54
$VAIC_i$	71	2.6909E9	-1770449.7315	2.6891E9	3.463189E8	1.0633445E8
MR_{it}	71	239.5340	-77.7150	161.8190	22.803886	5.8249832
year	71	7	1383	1390	1386.45	.271
Valid N (list wise)	70					

Descriptive Statistics

Source: research findings.

Table 3:Description of the data variables in the period 2004-2011.

	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
CEE_i	501997.44032	2.520E11	5.485	.287	30.941	.566
HCE_i	174.06667044	30299.21	3.736	.285	15.247	.563
SCE_i	1.7623248E8	3.106E16	2.287	.285	3.334	.563
$VAIC_i$	8.9598996E8	8.028E17	2.292	.285	3.347	.563
MR_{it}	49.0821804	2409.060	.783	.285	.848	.563
year	2.285	5.223	.014	.285	-1.225	.563
Valid N (list wise)						

Descriptive Statistics

Source: research findings

Detailed Tables (2) and (3) or tables of statistical variables describing the characteristics of statistical data in the period 2004-2011:

In general tables (2) and (3) is an indication of the statistical properties of time series describing a return or profit rate and the coefficient of performance variables of intellectual capital (human capital, structural capital, physical capital) equity firms used in the chemical industry. This feature is included in the skewness-elongation, the average number of observations for each time series.

4.2.1. Test the Assumption of Normality of the Data:

Since the normality of the dependent variable leads to a model of normality of residuals;It is essential prior model, the normal control. So, in this case the null hypothesis and assume Normality test is as follows:

$\begin{cases} \textbf{H}_0\textbf{:} \text{ Is a normal distribution of data.} \\ \textbf{H}_1\textbf{:} \text{ Is not normally distribution of data.} \end{cases}$

So at this stage, to test the assumption of normality of the data is used, the test of one-sample Kolmogorov-Smirnov test (K-S).

hus, since in this case every time, is less than 5% significance level, the null hypothesis is rejected at the 95% level of confidence.

Table 4: One-Sample Kolmogorov-Smirnov Test (K-S) to evaluate of the assumption of normality of variables

One-Sample Kolmogorov-Smirnov Test		CEE_i	HCE_i	SCE_i	$VAIC_i$	MR_{it}
N		70	71	71	71	71
Normal Parameters[a,b]	Mean	108294.71351	63.158	69472510.726	3.463189E8	22.804
	Std. Deviation	501997.440	174.066	1.7623248E8	8.9598996E8	49.0822
Most Extreme Differences	Absolute	.484	.351	.467	.510	.091
	Positive	.484	.351	.467	.510	.091
	Negative	-.411	-.267	-.343	-.349	-.059
Kolmogorov-Smirnov Z		4.046	2.961	3.932	4.293	.766
Asymp. Sig. (2-tailed)		.720	.872	.972	.625	.600
a. Test distribution is Normal. b. Calculated from data.						

Source: research findings.

Interpretation of test results One-Sample Kolmogorov-Smirnov Test(K-S) to evaluate of the assumption of normality of variables:

The values given (Table 4) or the test table Kalmvgraf - Smirnov KS)) to evaluate the assumption of normality of variables, It can be stated that, since the values of the significance level, the model is less than 5% (Sig> 0/05 or P-value), therefore, is rejected, the null hypothesis of normal distribution of variables. It is based on the number of values for the variables are presented in figure 70, if not the approval, normality tests, e used the Pearson correlation coefficient.

4.3. Data Analysis and Test Research Hypotheses

Model assumptions and estimates: According to what was discussed, as stipulated in the technical analysis and modeling, the research hypotheses are presented as follows:

The main test of the main hypothesis of the research model for the chemical industry: Chemical companies are more intellectual capital, a higher rate of interest.

H_0:Chemical companies are not the most intellectual capital, a higher rate of interest.
H_1:Chemical companies are more intellectual capital, a higher rate of interest.

Table 5: The Correlation coefficient test, coefficient of determination, adjusted coefficient of determination and camera test of Durbin-Watson between the two variables Value added intellectual capital ($VAIC_i$) a capital gains rate (MR_{it}) test the main hypothesis of the research chemical industry.

Descriptive Statistics	Mean	Std. Deviation	N
MR_{it}	2.3159	1.88062	71
CEE_i	.9735	.81919	71
SCE_i	5.1949	2.71921	71
HCE_i	5.6838	2.73776	71

Source: research findings.

Correlations		MR_{it}	CEE_i	SCE_i	HCE_i
Pearson Correlation	MR_{it}	1.000	-.044	.674	.747
	CEE_i	-.044	1.000	.171	.127
	SCE_i	.674	.171	1.000	.949
	HCE_i	.747	.127	.949	1.000
Sig. (1-tailed)	MR_{it}	.	.357	.000	.000
	CEE_i	.357	.	.076	.145
	SCE_i	.000	.076	.	.000
	HCE_i	.000	.145	.000	.

N	MR_{it}	71	71	71	71
	CEE_i	71	71	71	71
	SCE_i	71	71	71	71
	HCE_i	71	71	71	71

Source: research findings.

Variables Entered/Removed[b]			
Model	Variables Entered	Variables Removed	Method
1	HCE_i, CEE_i, SCE_i	.	Enter

a. All requested variables entered.
b. Dependent Variable: MR_{it}

Source: research findings.

Model Summary[b]									
					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.765[a]	.585	.567	1.23805	.585	31.506	3	67	.000	1.601

a. Predictors: (Constant), HCE_i, CEE_i, SCE_i
b. Dependent Variable: MR_{it}

Source: research findings.

According to Table 5, the correlation coefficient between the two variables of intellectual capital ($VAIC_i$) and capital gains rate (MR_{it}), which is equal to (.765[a]). The figure shows a 5% error in a meaningful relationship between the two variables of intellectual capital ($VAIC_i$) and capital gains rate (MR_{it}).

Thus, the output of software (SPSS) as shown in table (5), can be expressed, since the (sig) is less than five percent, assuming H_0 is rejected at level error of five percent, and is confirmed by the correlation between these two variables.

The adjusted coefficient of determination indicates that the calculated value (0.585), which is a good value and provide a good fit to the change in the value of the variable interest rate investments (MR_{it}) by changing variables of intellectual capital ($VAIC_i$).

On the other hand, the assumption of independence of errors in regression models, may be rejected if the assumption of independence of errors, and the errors are correlated with each other, there is no possibility of regression.

One of the most important tests of the hypothesis of independence deviation is the test statistic Durbin-Watson. So used the statistic Durbin-Watson, to verify the independence of the errors of each other, which is the value of the Durbin-Watson statistic from 1.5 to 2.5, reject the hypothesis of correlation between errors, and can be used to regression.

The Durbin-Watson statistic is the number of tables table (5), an amount equal to (1.601), and this figure shows that the errors are independent of each other and there is no correlation between their errors and correlations between the hypothesis is rejected errors , and can be used for the regression.

Table 6: Regression analysis of variance test (ANOVA)

ANOVA[b]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	144.876	3	48.292	31.506	.000[a]
	Residual	102.696	67	1.533		
	Total	247.572	70			

a. Predictors: (Constant), HCEi, CEEi, SCEi
b. Dependent Variable: MR_{it}

Source: research findings.

Table (6) shows the analysis of variance is between intellectual capital variable (VAICi), as the independent variable and the capital gains rate (MRit) as the dependent variable, the output of the test is significant overall regression model. by motif analysis of variance (ANOVA), and the following statistical hypotheses:

H_0:There is no linear relationship between two variables.

H_1:There is a linear relationship between two variables.

Since the significance level of the test (Sig), is less than five percent, assuming a linear relationship between two variables is confirmed. We then calculated the regression analysis, going, looking to find the relationship:

Table 7:Test regression coefficients(Coefficients)

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-.411	.371		-1.107	.0272	-1.151	.330					
	CEEi	-.292	.185	-.127	-1.580	.0119	-.660	.077	-.044	-.190	-.124	.958	1.044
	SCEi	-.196	.174	-.283	-1.125	.0265	-.544	.152	.674	-.136	-.089	.097	10.258
	HCEi	.709	.172	1.032	4.122	.000	.366	1.052	.747	.450	.324	.099	10.121

a. Dependent Variable: Mrit

Source: research findings.

The Output table (7) and in column (B), respectively, are presented, and the constant coefficient of the independent variable in the regression equation, and the equation is as follows:

$$MR_{it} = -.411 - .292. CEE_i - .196.SCE_i + .709.HCE_i + e_{it}$$

The output table (7), and the remaining columns of the table include: standard coefficients in column (B), Student t test (t) test significance level (sig), which is used to test the hypothesis of equality coefficients of column (B), with a zero. If the beta (β) and alpha (α), are, respectively, the constant and the slope of the regression, hypothesis testing for these two quantities can be written as follows:

$$\begin{cases} H_0 : \beta = 0 \\ H_1 : \beta \neq 0 \end{cases} \quad , \quad \begin{cases} H_0 : \alpha = 0 \\ H_1 : \alpha \neq 0 \end{cases}$$

Since, in this output, the significance level (Sig=0.000), the test score regression coefficient and constant, is equal to zero, and less than five percent. Thus, these two coefficients equal to zero is rejected and shall not be deemed to be deleted from the regression equation.

Histogram

Dependent Variable: Mrit

Mean = -1.61E-16
Std. Dev. = 0.971
N = 70
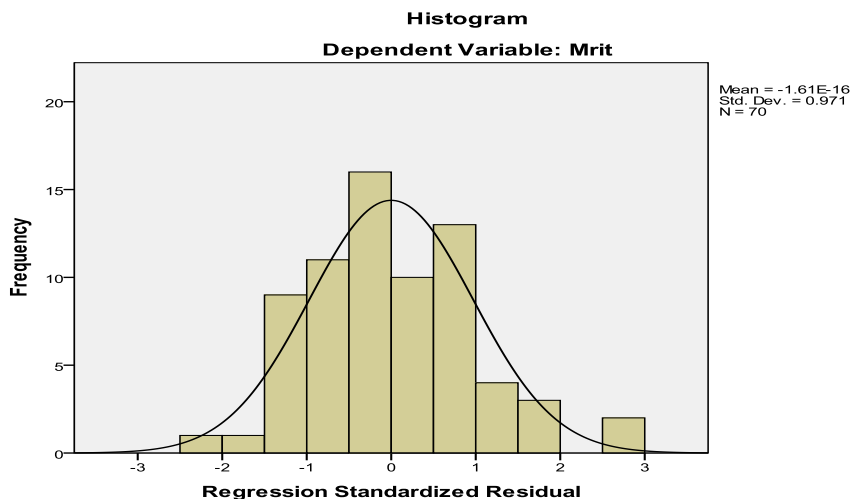
Figure 3:Test the normality of regression errors

Figure (7), presents the regression assumptions of normality of the errors as another. According to this assumption, regression errors are normally distributed with mean zero, that is, according to the diagram above,(Stad.Dev=(0.971), Mean=(-1.61e16), and is shown in the right diagram. So with these assumptions, we can use the equation of the regression analysis on the relationship between two variables: intellectual capital ($VAIC_i$), as the independent variable and the capital gains rate (MR_{it}), as the dependent variable.

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: Mrit
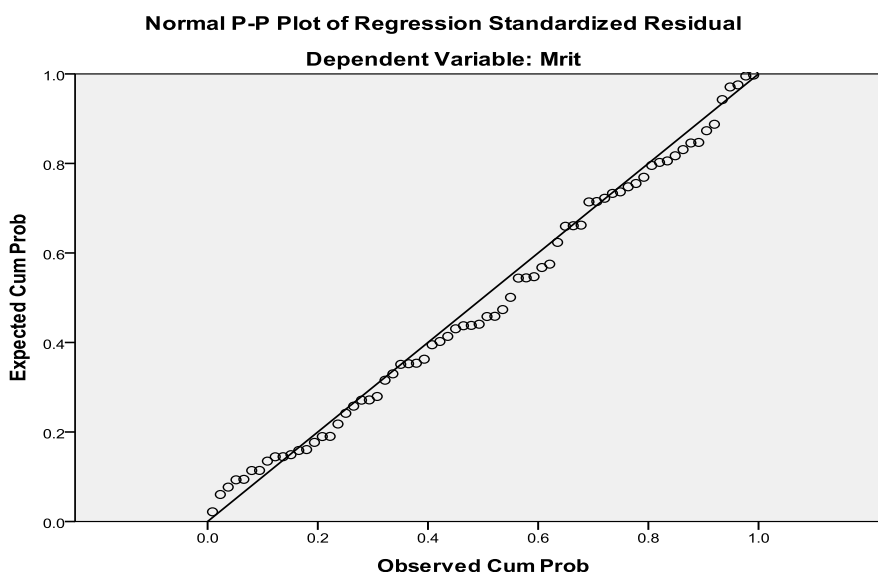
Figure 4: line and regression equation.

Figure(8), shows the average rates of dispersal between variables, also shows an equation, simple linear regression and correlation coefficient of the two variables of intellectual capital ($VAIC_i$), as the independent variable and the value of interest rate a (MR_{it}) as the dependent variable. These results are consistent with the results of the simple linear regression method.

5. Discussion and Conclusion

As explained in the data analysis, the primary objective of this study was to investigate the effect of intellectual capital on capital gains for investors. Said to be one of the most significant signs connector for capital gains to investors in a time series, is a significant test

statistic values obtained from the estimation model. Therefore, the results obtained, as can be observed is that a strong relationship at the majority of time series study. Also has the objective of this study was to compare the effect of intellectual capital on capital gains invested in Tehran Stock Exchange for the chemical industry as an example. To achieve this goal, the use of econometric techniques and regression test-taking. To achieve the objectives of the present study, we have examined the models provided by the chemical industry, chemical industry data.

5.1. Summary of results and discussion of the main research hypothesis

Based on the results obtained in the present study it can be concluded that, the Pearson correlation coefficient between the two variables of intellectual capital ($VAIC_i$) (as independent variables), and the capital gains rate (MR_{it}), (as Dependent Variable) equals (.765[a]). These numbers indicate that the research hypothesis. Stating that there is a linear relationship between two variables of intellectual capital (VAICi) (as independent variables), and the capital gains rate (MRit), (as Dependent Variable). However, it is worth noting that the results of the present study corresponds with the results of research conducted by Chang,Shuline (2008), Zou,Xiaopeang,Huan,Tzung–cheng.,(2011), but the research does not align with research conducted by Puntilo, P,(2009).

5.2. Recommendations for Future Research

According to the study results in the theory of first, second, third and main hypothesis of the research chemical industry,Is that the components of intellectual capital and its impact on investment income or capital gains rate.

So suggestions are offered, as follows:

1-to investigate the relationship between human capital variables (HCEi) and capital gains rate (MRit), in other industries in the Exchange. The results of this study can be compared with the results of the analysis.

2-to investigate the relationship between two variables, structural capital (SCEi) and capital gains rate (MRit), in other industries in Bhadard Exchange. The results of the research to be analyzed. Place.

3-to investigate the relationship between two variables related investments (CEEi) and capital gains rate (MRit), in other industries in the Stock Exchange. The results of this study can be compared with the results of the analysis.

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