

The review on impact of intellectual capital on financial performance of investment companies accepted in Tehran Stock Exchange Organization (TSEO)

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Abstract

The present period is age of knowledge based economy. By virtue of the existing limitations in tangible sources, today role and importance of intangible sources has been highly improved. According to the attitude based on corporative sources, one of the important sources for enterprises is intellectual capitals, particularly in investment companies that are usually benefitted from less tangible sources. Thus, the present study is intended to examine the impact of intellectual capital on financial performance of investment companies which have been accepted in Tehran Stock Exchange Organization (TSEO) within the studied time period (2006-2010) and the selected sample comprises of 28 investment enterprises. In order to measure intellectual capital, Value- Added Intellectual Capital (VAIC) factor, which had been codified by Palick (2000), was used that is one of the paramount and most valuable evaluation techniques for intellectual capital. The results obtained from testing hypotheses in this study that derived by means of Ordinary Least Squares (OLS) regression suggest that intellectual capital has direct and significant effect on financial performance of investment companies and at the same time there is a direct and significant correlation among intellectual capital and future performance.

Keywords: Intellectual Capital, Financial Performance, Value- Added Factor, Investment Companies

Introduction

Modern developments in the field of economy, globalization, and its consequences have caused enterprises' performance to be taken further into consideration. At past, most of evaluations were conducted as assessment of enterprises' performance with financial and tangible parameters of an institution. Today, a new model for assets has been purposed and generally organizational assets are divided into groups of tangible and intangible assets in which the intangibles assets regarding manpower are called intellectual capital in general so evaluations have tended to this direction. As one of the pioneers in study on this field, Thomas Stewart (1997) purposed term "Intellectual Capital" for these assets.

Knowledge role of intangible assets was also purposed like patents step by step. What we observe in financial statements under title of asset is a report from sum of these two assets but at least it can be implied about intangible assets that there are certain and limited definitions in this regard so that financial reports no longer meet manager's information requirements and users of these reports while organizations tend to identify non- financial parameters as performance derives, value creation, and pricing.

The current investigation seeks for finding this point that if intellectual capital affects on financial performance of investment companies that accepted in Tehran Stock Exchange Organization (TSEO).

Research theoretical bases

Today, role and importance of the intellectual capital efficiency on profitability, and profit stability and constant sustainability of enterprises are employed more than financial capital. In other words, compared to intellectual capital, the role of financial capital in determining sustainable profitability has been noticeably decreased in current knowledge based communities. Due to ever-increasing importance of intellectual capital in process of corporative strategic superiority, many enterprises search for finding intellectual capital measurement techniques and review its relation with financial performance of enterprises. The current study tends to acquire empirical evidences about the relationship among intellectual capital and corporative financial performance.

Intellectual capitals are strategic sources that enable companies to create competitive advantage and to present better performance. Therefore, with respect to role and importance of intellectual capital, it seems necessary to review its relation with financial performance.

Since with respect to type of the activities and missions which the investment companies are responsible for, they are benefitted from fewer tangible sources than other enterprises and they mainly rely on intellectual capitals. Thus, this increases doubly the study on the impact of intellectual on financial performance of these enterprises.

Intellectual capital: It includes intangible assets comprising of technology, customers' information, organizational reputes and culture, which are crucially important and vital in terms of competitiveness potential. Usually, intellectual capital is considered as an exogenous variable while organizational performance is deemed as endogenous variable (Mostafa Jafari; 2005). Intellectual capital is not only a static intangible asset per se, but it serves as an ideological process and a device for achieving the goal (Bonits Nick; 1998). Different elements of intellectual capital lead to improving management and using it at operational and strategic level (Shikiji; 2004). The most frequent classification divides intellectual capital into three elements namely human capital, structural capital, and customer capital

Human capital: Simply, human capital denotes knowledge inventory in each of personnel in an organization (Bonits Nick; 1998). Human capital is the starting point for stages, source, and origin of innovation and the beginning of perception and insight (Sinmink- Sine; 2005) and the essential element for realization of intellectual capital (Stewart T.A; 1997). Also human capital is the basis and cornerstone for intellectual capital and storing organizational knowledge that is reflected by personnel (Mostafa Jafari; 2005). Ownership of this type of capital is not at enterprises' disposal and departure of personnel from the organization may lead to lose organizational memory (Bonits Nick; 1998). Personnel create their own competences (merits) and attitudes and mind cunning where these organizational merits cover skills, education, and attitudes of personnel as their behavioral elements (Baker J. S; 2001).

Structural capital: It consists of all non- human knowledge reservoirs in an organization that include databases and organizational charts and procedural instructions and strategies and or any other thing that improve value for the organization rather than those materials (Bonits Nick; 1998). Structural capital has been defined in such a way that it remains in the organization after personnel return to their homes and it is arisen from organizational process and routine (Ross J.; 1998). Personnel may possess wisdom at high level but if the organization suffers from poor systems and procedures and thereby personnel follow up that operation then potential capacity of intellectual capital will not been realized entirely. Organizations with structural capital have a supportive culture that allows personnel to experience new phenomena, learning, failure and repeating the same experience (Bonits Nick; 1998).

Customer capital: It is a group of all assets that arrange and manage corporative relationships with the environment and this capital includes enterprise's relation with customers and shareholders

and suppliers, rivals, government, public institutions and society (Sanchez M. P; 2000). The employed knowledge in marketing channels of organization and relations with customer during business performance is the main theme in customer capital (Bonits Nick; 1998). Investment companies: They are some enterprises that their activity is to invest in bonds and securities (Golriz, Hassan; 1997). Term “Investment Company” is used for displaying a group of sources mobilizing companies in the composed sector of capital sources market (Investment Company; mobilization of monetary sources for national economy, monograph of Bourse Weekly Report, (1997); page-11).

Review of literature

The term Intellectual Capital was purposed for the first time by John Kenneth Galbraith (1969). He not only implies intellectual capital as a fixed asset but also considers it as a tool to achieve the goal.

Many studies have been carried out by Economic Cooperation Organization (ECO) regarding intellectual capital since 1982 and in some European countries like Norway, Netherlands, Denmark, and Ireland etc, several investigation have been conducted.

Bonits (1998) carried out a study in Canada. This study indicated that there are mutual relations among elements of intellectual capital and all three human, structural, and intellectual capitals may affect well on commercial performance.

Bonits et al (2000) conducted a survey in servicing and non- servicing industries at Malaysia. The results showed that there are mutual relations among intellectual capital elements and these capitals can affect on commercial performance at relatively average level (approximately 20-30%).

Meritum project was sponsored financially by European Committee (EC) in 2000. In fact this project was intended to purpose some guidelines for measurement and managing intellectual capital in order to improve decision making for managers and shareholders.

The following results were obtained from a study, which has been carried out by Bozbura (2004) in Turkey. Both human and intellectual capitals have affected on book value and market value in enterprises.

Also in 2005, similar to Malaysian study, an investigation was conducted in Information Technology (IT) Industry in Taiwan and the relations among intellectual capital and performance of causal models were analyzed and confirmed the results of Malaysian studies.

Atieh Bathaei (2006) evaluated the impacts of intellectual capital on organizational performance in Mellat Bank branches at Tehran and concluded that despite of lack of recording this capital in bank’s balance sheet, intellectual capital noticeably affected on performance, value, and profitability of organizations. Naser Izadnia (2005) carried out a study under title of “A critique on accounting criteria for evaluation of performance” and suggested some economic value- added criteria and free cash flows in reporting performance of commercial unit as the best criterion for this purpose.

In another survey done by Namazi and Ebrahimi (2010) under title of “Review on impact of intellectual capital on the present and future financial performance of enterprises accepted in Tehran Stock Exchange Organization TSEO”. The findings from this investigation signify that there is positive and significant relationship among intellectual capital and corporative present and future performance both at level of all enterprises and level of industries.

Methodology

The current study is a semi- empirical investigation and it is of documentary type in terms of data collection and it is of applied kind in terms of objective, and descriptive inductive type in terms of methodology and correlation form from aspect of testing hypotheses. Single- and multivariate

regressive models and composed model have been utilized as tools to test the given hypotheses. This type of research has purposed useful information and remarkably contributed to growth and developing the related knowledge. Similarly, this survey is considered as applied type in terms of results and objectives. The analytical descriptive method is deemed as a technique to conduct this study in which the existing correlation between variables of research hypotheses is investigated. In this course, in order to examine significance level of relations among variables, demonstration of validity, and reliability of model, t- statistic student and Fischer's F- statistic are used. Meanwhile, regression analyses will be adapted to test hypotheses and their analysis as well.

Research hypotheses

With respect to theoretical bases and research history and in order to achieve the above goals, the following hypotheses are presented:

1. Intellectual capital affects on financial performance of investment companies.
2. There is correlation among intellectual capital of investment companies and their future performance.

Sample and population

In this study, statistical population includes investment companies during period (2006-2010) that their financial statements have been accepted by Tehran Stock Exchange Organization (TSEO). The following items have been considered in selection of the sample:

1. The given enterprise had no transactional interruption for more than three months during fiscal year;
2. During research period, the aforesaid company had no financial loss and also net book value and equity of shareholders were not negative;
3. Financial statements of the enterprise and full information and notes together with corporative financial statements are available.

Given that total number of investment companies, which accepted in Tehran Bourse (TSEO), was 38 enterprises after enforcing the above constraints, number of select companies was reduced to 28 in the given sample.

Research Model

To improve managers' comprehension about role of intangible assets (intellectual capital) in creating competitive advantage, several techniques have been present so far for evaluation and measurement of intellectual capital. In this study, Value- Added Intellectual Capital (VAIC) by Palick (2000) will be adapted. This model includes 5 steps as follows:

Step I) Determination of value- added

$VA = OUT - IN = VA$ (company's value- added) = Total income from sale of goods and services (OUT) = Total costs for the purchased materials, elements, and services (IN)

In this model, due to active role of manpower in value- added process, salary and wage costs are not included in part IN; therefore, the relevant cost for personnel is not considered as the given cost but it serves as capital. Value- added may be calculated by the existing information in annual report as follows:

$VA = OP + EC + D + A$

Op: Operational profit

EC: Cost of manpower

D: Depletion of manpower

A: Depletion of intangible assets

Step II) Capital Employed Efficiency (CEE)

This efficiency is obtained from the following formula:

$CEE = VA / CE$

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CEE: Capital Employed Efficiency
 CE: Capital Employed Efficiency is equal to total book value of the enterprises less its intangible assets
 Step III) Determination of Human Capital Efficiency
 According to this model, total cost for personnel is considered as human capital:
 $HCE = VA / HC$
 HCE: Human Capital Efficiency
 HC: Human capital is equal to sum of corporative salaries and wage
 Step IV) Determination of Structural Capital
 It is computed by the following formula:
 $SC = VA - HC$
 SC: Structural capital
 $SEC = SC / VA$
 SEC: Sum of structural capital
 Now, one can calculate intellectual capital efficiency based on the following formula:
 $ICE = HCE + SCE$
 ICE: intellectual capital efficiency
 Step V) Determination of Intellectual capital coefficient
 The last step concerns with intellectual capital factor that is obtained according to following formula:
 $VAIC = ICE + CEE = HCE + SCE + CEE$
 This coefficient indicates value- added efficiency or corporative intellectual potential (VAIC).

Research Variables

Research independent variable

In this survey, intellectual capital is measured by method of Palick (2000) that is considered as independent variable and its parameters are as follows: Capital employed efficiency (CEE), Human capital efficiency (HCE), and Structural capital efficiency (SCE) where they are computed based on value- added coefficient.

Dependent variable

In this study, dependent variable is financial performance of investment companies that is measured by ratios of Return On Equity (ROE) of shareholders to Return On Assets (ROA).

1) Return On Assets (ROA): This ratio denotes efficiency of using assets and it indicates the interest (in Rials) acquired from the invested funds in the given enterprise.

$$ROA = NI / TA (A)$$

ROA: Return on assets

NI: Net interest

TA (A): Total assets (mean)

2) Return On Equity (ROA) for shareholders: This ratio expresses the efficiency of using equity by normal shareholders and it shows corporative interest against each of shareholders' equities.

$$ROA = NI / SHE (A)$$

ROA: Return on equity of shareholders

NI: Net interest

SHE (A): Shareholders' equity (mean)

Data analysis method

Data analysis is a multi- stage process in which collected data by different forms are summarized, classified, and finally processed in order to prepare ground for conducting various analyses and relationship among data for testing hypotheses. In this process, data are refined both conceptually and empirically and several statistical techniques play essential role in deductions and generalization (Khaki, 2005: 305). In this chapter, research hypotheses are tested by means of the collected data from research statistical sample including 28 investment companies within period (2006- 2010).¹ The method of testing hypotheses in this study is Panel Data that has been conducted via Eview software. In the following, first in order to recognize statistical population and the studied variables further, a summary of descriptive statics for research variables is presented. Then according to the conducted classification regarding research hypotheses, we will deal with testing hypotheses and analysis on the given results.

Research descriptive statistics

Those techniques by which the collected information could be processed and summarized are called descriptive statistics. This type of statistics only deals with description of population or sample and it is aimed at calculation of parameters of research population or sample (Azar & Momeni, 2010: 8). In this regard, mean is the most major parameter of central tendency and it shows data average so that if data are arranged regularly on a single axis, the mean value will be exactly the balance point or distribution centroid. Standard deviation is dispersion from parameters and indicates the amount of data dispersion. Also skewness is a parameter that shows dissymmetry of statistical distributions. If population is symmetrically distributed then skewness coefficient is set zero but if skewed population is diverted into the left side it has negative skewness coefficient and skewness coefficient will be positive if skewness of population is diverted into right side. Kurtosis is also another parameter that indicates sharpness and peakedness of distribution proportional to normal distribution. By the aid of SPSS software, a summary of the relevant descriptive statistics status for research variables has been purposed after screening and omission of outliers² in Fig (4-1).

With respect to Fig (4-1), mean value of intellectual capital for the sampled investment companies has been measured by means of value- added intellectual capital (VAIC) model (Palick, 2000) that is 75.240 and its highest and lowest values are respectively 1.455 and 411.86. Table 1 displays annual trend of intellectual capital in the sampled investment companies within time interval of the research.

The review of the descriptive statics relating to variable of intellectual capital growth rate also expresses that intellectual capital of investment companies has the average value of growth as 11.43%. The lowest and highest growth rates are also respectively as -95.97% and 538%. In Figure 1, annual trend for this variable has been shown as well.

Similarly, with respect to the present descriptive statistics in Figure 3, the mean value of rate of efficiency for assets in sampled enterprises has been measured by using operational profit ration after deduction of tax to total assets, which is 12.21% and this figure suggests that average rate of profitability for investment companies is 12.21% of their assets. Regarding rate of return on equity for shareholders, mean value of this variable is 18.94% and this confirms this fact that in average,

¹ - It should be noted that with respect to using the relevant data to the future performance in second hypothesis, the related research data for this variable have been also gathered in 2011.

² - Outliers are some observations that are distant farther than other data and their values are greater or smaller than other amounts among group of data. Outliers may affect adversely on statistical analyses including rising error variance, reduced potential of test, disturbing data normal distribution, and oblique approximation of parameters and it necessitates making decision about their omission after identifying them.

the sampled investment companies have acquired profit about 18.94% of their shareholders' equity. By review of this trend, in order to become normal, skewness and kurtosis values for these two variables should be zero and 3 respectively. So, this means that both variables are not normally distributed. In Diagram (4-3), annual trend of rates of return on assets (ROA) and shareholders' return on equity (ROE) have been presented for the investment companies.

Table 1. Descriptive statistics of research variables

Variable	N	mean	Standard Deviation	Minimum	Maximum	Skewness	Kurtosis
Intellectual Capital VAIC	136	75.240	90993	1.455	411.865	1.675	5.416
Intellectual Capital Growth rate (VAIC Growth)	138	0.1143	0.9302	-0.9597	5.3853	2.996	14.237
Return on assets(ROA)rate	140	0.1221	0.0767	0.0049	0.3500	0.858	3.256
Rate of shareholders' return on equity(ROE)	140	0.1894	0.1140	0.0058	0.5017	0.680	2.835

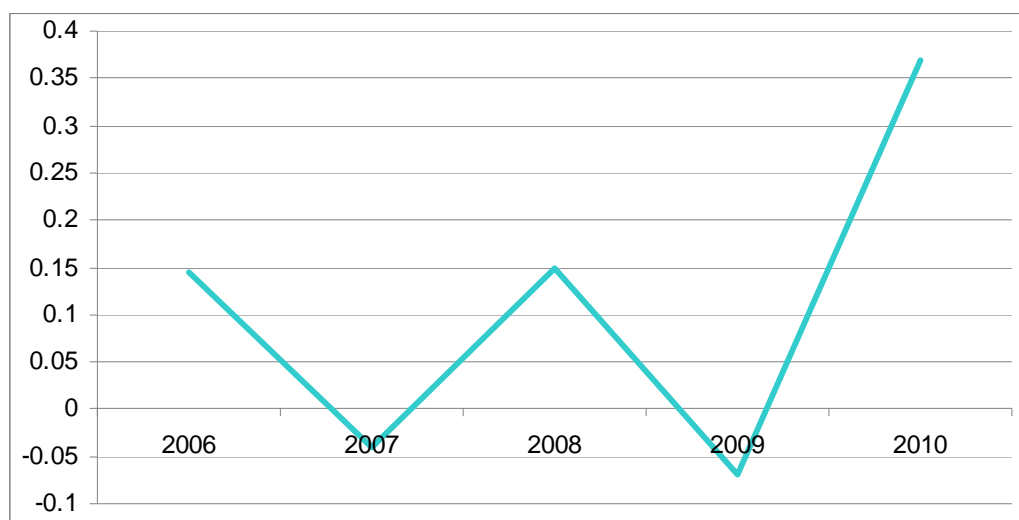


Figure 1. Trend of growth rate for intellectual capital during years (2006-2010)

Test distribution normality in dependent variables of research

In the present survey, in order to approximate model parameters, Ordinary Least Squares (OLS) regressive technique has been utilized where this method is based on this assumption that research dependent variable is normally distributed. Abnormal distribution of dependent variable leads to violation from regression assumptions for parameters approximation and it will be followed by improper results. Thus, it necessitates testing normality of distribution for the research dependent variable. In the present study, this issue is examined through Bera- Jarque normality test. Null hypothesis and the opposite assumption in this test are as follows:

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$$\begin{cases} H_0: Z \sim N(0,1) \\ H_1: Z \neq N(0,1) \end{cases}$$

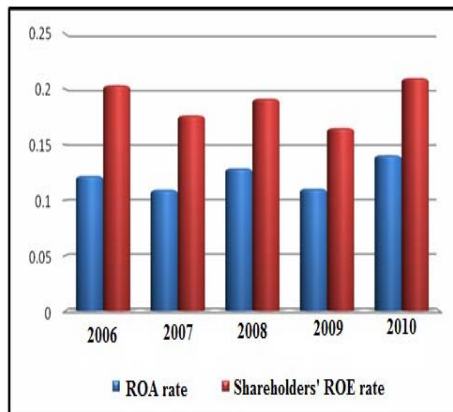


Figure 2. Annual trend of rates of ROA and ROE of shareholders in the sampled enterprises

If testing statistic is greater than 0.05 ($p > 0.05$), null hypothesis H_0 is accepted, that is based on normality of variable distribution. The results of Bera- Jarque test are given in table 2 for variables of ROA and shareholders' ROE rates.

Table 2. Test results for normality of distribution in research dependent variables

Variable	Bera-jarque statistic	Significance level
Return on assets(ROA)rate	17.598	0.0001
Rate of shareholders' return on equity(ROE)	10.969	0.0041

Given that significance level of Bera- Jarque statistic is lesser than 0.05 for both dependent variables; thus, first hypothesis H_1 based on which these variables are abnormally distributed will be confirmed at 95% level of confidence. In other words, variables of ROA and shareholders' ROE rate are not normally distributed. Therefore, it requires this variable to be normalized before testing hypotheses. In order to normalize data in this study, initially Johnson Transformation Function was used and its process and results have been given in the appendix. The results of Bera- Jarque test after data normalization are given in table 3.

Table 3. Test results for normality of distributed dependent variable after normalization

Variable	Bera-jarque statistic	Significance level
Return on assets(ROA)rate	0.642	0.7250
Rate of shareholders' return on equity(ROE)	0.653	0.7211

With respect to table 3, since significance level of Bera- Jarque statistic is greater than 0.05 for both variables after data normalization so null hypothesis H_0 is approved at 95% level of confidence. In other words, research dependent variables are distributed normally after normalization process.

Results of testing research hypotheses

In this part, the related statistical testing is done for each of the hypotheses and then we will interpret the given results for them separately.

The results of testing first research hypothesis

Testing of first hypothesis is aimed at review on the impact of intellectual capital on financial performance of the investment companies and its statistical hypothesis is defined as follows:

H_0 : Intellectual capital does not affect on financial performance of the investment companies.

H_1 : Intellectual capital affects on financial performance of the investment companies.

Whereas in this study enterprise's performance has been examined at two levels of ROA rate and shareholders' ROE rate so two following regression models are codified for testing first hypothesis:

$$(1) ROA_{i,t} = \alpha + \beta_1 VAIC_{i,t} + \beta_{it}$$

$$(2) ROE_{i,t} = \alpha + \beta_1 VAIC_{i,t} + \beta_{it}$$

Models approximation

In order to characterize whether using panel data techniques is efficient for the above models or not, Chow test is adapted and in order to be identified which method (positive effects or random impacts) is more appropriate for approximation Hausman test has been utilized. The results of these tests are given in table 4.

Table 4. Results of selecting model for approximation of research models

Model	Type of test	Test statistic	Test statistic value	Degree of freedom(d.f)	P-value
First	Chow test	F	8.781	(107.27)	0.0000
	Haueman test	X2	2.404	1	0.1210
Second	Chow test	F	10.612	(107.27)	0.0000
	Haueman test	X2	3.664	1	0.0556

With respect to the results derived from Chow test, since P- value is lesser than 0.05 in both models while inconsistency of intercepts is accepted and panel data technique could be used at significance level (95%). Likewise, according to results came from Hausman test and its P- value, it requires P- value to be greater than 0.05 in both models so it necessitates approximating both models by random effect method. In this sense, and with respect to results of Durbin- Watson test for primary approximation of models, the presence of residues auto- correlation problem has been verified in both models. So in order to resolve it, first- order auto- correlation variable AR (1) entered into models. In table 5, the results of approximation on both models are given.

Similarly, the results relating to statistics of models approximation and assumptions from classic regression are presented in table 6.

The approximated form of models in Eview software is also as follows:

$$(1) ROA_{i,t} = [0.1401 + 0.0022VAIC_{i,t} + 0.6960AR(1)$$

$$(2) ROA_{i,t} = [0.1401 + 0.0022VAIC_{i,t} + 0.6960AR(1)$$

Table 5. Results of testing research first hypothesis

Variable	First model(ROA)	Second model(ROE)
Fixed coefficient	-0.1401	-0.1440
t-statistic	(-12.948)	(-2.074)
p-value	(0.0499)	(0.0405)
Intellectual capital	0.0022	0.0019
t-statistic	(3.622)	(3.222)
p-value	(0.0005)	(0.0017)
AR(1)	0.6960	0.6827
t-statistic	(11.724)	(12.126)
p-value	(0.0000)	(0.0000)

Similarly, the results relating to statistics of models approximation and assumptions from classic regression are presented in table 6.

Table 6. Results of approximation statistics of models and the relevant tests to regression assumptions

ROA _{i,t} Model	Determination coefficient	F-statistic		Jarque-Bera statistic		Breusch-pagan statistic		Durbin-Watson statistic
	R2	P-Value	F	P-Value	X2	P-Value	F	D
First	0.5480	63.656	0.0000	0.676	0.7129	0.059	0.8081	2.45
Second	0.5307	59.377	0.0000	0.038	0.9809	0.834	0.3627	2.44

In review of total significance of models, given that probability value (P-value) of F- statistic is lesser than 0.05 in both models (0.000) so significance of models is totally verified at 95% confidence. Models determination coefficient also denotes that 54.8% of variance of ROA rate and 53.07% of variance of shareholders' ROPE rate in investment companies are interpreted by their intellectual capital. Similarly, in order to measure reliability of model and review of assumptions of classic regression some tests should be also conducted regarding normality of residues, consistency of variances and independence of residues. In this study, Bera- Jarque test has been adapted to test normality of erroneous sentences. Results of this test suggest that in both models, the resulting residues from approximation of model are normally distributed at 95% level of confidence. Therefore, probability value (P-value) for this test is greater than 0.05 in both models. Variance consistency of residues is one of the other statistical assumptions for classic regression. In order to review consistency of variances in this survey, Breusch- Pagan (heteroscedasticity) test has been adapted. Given that probability value (P- value) for this test is greater than 0.05 in both models so consistency of residues variance is verified. At the same time, in order to determine that residues are not correlated in this study, which is one of the assumptions in regressive analysis and it is called auto- correlation, Durbin- Watson test was utilized. In this regard, since value of Durbin- Watson test statistic is placed among 1.5 and 2.5 in both models so independence of residues is also confirmed for both models.

Interpretation of results of testing first hypothesis

According to the given results in Diagram 5-4, in both models approximated coefficient for variable of intellectual capital is positive (0.0022 in first model and 0.0019 in second one) and its probability value (P-value) is lesser than 0.05 (0.0005 in first model and 0.0017 in second model).

Thus, null hypothesis H_0 is rejected at 95% level of confidence and it may be expressed that intellectual capital directly and significantly affects on enterprise's performance at two levels of ROA and shareholders' ROE. As a result, research first hypothesis is verified.

Results of testing second hypothesis

Second hypothesis in this study reviews the existing correlation among growth rate of intellectual capital for investment enterprises and their future performance and defines its statistical assumption as follows:

H_0 : There is no correlation among intellectual growth in investment companies and their future performance.

H_1 : Intellectual growth in investment companies is correlated to their future performance.

To test this hypothesis, Pearson's correlation coefficient has been utilized and its results are given in table 7.

Table 7. Results of testing correlation in growth rate for intellectual capital with future performance

Variable	Pearson's correlation coefficient	t-value	p-value
Assets future efficiency rate	0.6148	0.092	0.0000
Shareholder s' equity future efficiency rate	0.5908	8.540	0.0000

With respect to the given results in table 6, correlation coefficient for future efficiency of assets with growth rate of intellectual capital is 0.6148 and since its error level is lesser than 0.05 (0.0000) so it could be implied that there is direct correlation among rate of assets future efficiency and growth rate of intellectual capital in investment companies so that variances of these two variable are in the same direction. Similarly, correlation coefficient of shareholders' ROE future efficiency with growth rate of intellectual capital is 0.5908 and since its error level is lesser than 0.05 (0.0000) so it may be expressed that there is direct and significant correlation among Rate of shareholders' ROE and growth rate of intellectual capital for investment companies so that variance of these two variables is also in the same direction. With respect to the above findings it can be concluded that there is direct and significant correlation among growth rate of intellectual capital in investment companies and their future performance and second hypothesis of the research is also approved at 95% level of confidence.

Discussion, conclusion, and suggestion

In this study, by means of the collected data from statistical sample of research including 28 investment companies within the given period (2006-2010) the research hypotheses are tested.³ Panel data technique is the method to test hypotheses in this study by means of Eview software.

³ - It should be noted that with respect to using the relevant data to the future performance in second hypothesis, the related research data for this variable have been also gathered in 2011.

Likewise, the present study has been conducted to review the reliability of regressive model by means of the following tests:

- 1) Bera- Jarque test (to determine normality of dependent variable);
- 2) Hausman test and Chow test- to examine application of panel data technique.
- 3) Durbin- Watson test- auto- correlation among variables;
- 4) While presence of the problem of residues auto- correlation had been verified in primary results of model approximation so in order to remove this problem, first- order auto- correlation variable AR(1) entered into these models.

Similarly, to examine consistency of variances in this study, Breusch- Pagan test was utilized.

Summary of research findings

The important findings of this study may be expressed as follows.

With respect to analysis of hypotheses which was presented in Chapter 4, the general conclusion for this research is as follows:

Result of testing first hypothesis: Approximated coefficient of variable intellectual capital is positive for both models (0.0022 in first model and 0.0019 in second one) and its probability value (P-value) is lesser than 0.05 (0.0005 at first model and 0.0017 at the second). Therefore, null hypothesis H_0 is rejected at 95% level of confidence and it can be expressed that intellectual capital directly and significantly affects on enterprise's performance at both level of ROA and ROE. As a result, first hypothesis is confirmed in this research.

Result of testing second hypothesis: The coefficient of correlation among assets future efficiency (ROA) and growth rate of intellectual capital is 0.6148 and given that its error level is lesser than 0.05 (0.0000), it could be implied that there is direct and significant correlation among rate of assets future efficiency and growth rate of intellectual capital in investment companies so that variances of both variables are in the same direction. Similarly, coefficient of correlation of shareholders' equity future efficiency and growth rate of intellectual capital is 0.5908 and since its error level is lesser than 0.05 (0.0000) thus it can be mentioned that there is direct and significant correlation among rate of ROE future efficiency and intellectual capital for investment companies so that variance of these two variables are in the same direction. With respect to the above results, one can conclude that there is direct and significant correlation among growth rate of intellectual capital in investment companies and their future performance therefore second hypothesis of this study is also confirmed at 95% level of confidence.

Table 8. Results of testing hypotheses

Title of hypothesis	Test result
Intellectual capital affects on financial performance of investment companies.	Not rejected
There is correlation among growth rate of intellectual capital of investment companies and their future performance.	Not rejected

Suggestions for future study

1. In this study we have only examined the impact of intellectual capital on financial performance of investment companies, which are some types of servicing enterprises. Here it is suggested to review the effect of intellectual capitals on financial performance in manufacturing companies. Similarly, as another assumption, one could compare the impact of personnel's expertise in administrative sector on profitability of an enterprise.

2. In line with second hypothesis, which examines the relationship among growth rate of intellectual capital for investment companies and their future performance, one can define an assumption for this purpose as follows:

Growth rate of intellectual capital among servicing enterprises may affect further on their future performance than in manufacturing companies.

References

- Abeysereka, I. (2008), Intellectual Capital, practices of firms and commodification of labor, *Journal of Auditing & Accountability*, 36-48.
- Alem Tabriz, A., & Rajabifard F. A. (2009). Intellectual capital, Iranian Industrial Training and Studies Center Press.
- Azar, A. & Momeni, M. (2006). Statistics and its application in management, SAMT Pub, 2nd Ed.
- Bontis, N., Keow, W. C. C. & Richardson, S. (2000). Intellectual capital and business performance in Malaysian industries. *Journal of Intellectual Capital*, 1, 85-100.
- Chen, M.C., Cheng, S.J. & Hwang, Y. (2005). An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance. *Journal of Intellectual Capital*, 6, 79.
- Chen, M.C., Cheng, S.J. & Hwang, Y. (2005). An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance. *Journal of Intellectual Capital*, 79.
- Dipankar Gh. & Wu, A. (2007). Intellectual capital and capital markets: additional evidence. Retrieved from www.emeraldinsight.com/1469-1930.htm
- Ester Oliveras & Yulia Kasperskaya (2004). Reporting Intellectual Capital in Spain- library at: <http://ssrn.com/abstract=551645>
- Fabrizio E.D. (2009). Aggregate, Tobin's q and External Finance, Investment Catalan Newcastle University Business, Newcastle upon Tyne, NE1 7RU, School, UK
- Farzin R. et al (2010). Intellectual capital and value based performance of intellectual capital, *Journal of auditing and accounting studies*, 7, 52-71.
- Firer, S. & William S.M. (2003). Intellectual Capital and Traditional Measures of corporate performance, *Journal of Intellectual Capital*, 4 (3), 348-360.
- Hemati S. & Mehrani, H. (2010). Review the relationship among intellectual capital and financial efficiency of the enterprises accepted in Tehran Stock Exchange Organization TSEO.
- Kamath, G. Barathi (2007). The Intellectual Capital Performance of Indian Baking Sector.' *Journal of Intellectual Capital*, 3, 96-123.
- Khaki, Gh. (2003). Methodology with an approach toward thesis writing, State Scientific Studies Center Press.
- Khavandkar J. & Motaghi, A. (2009). Intellectual capital, management, development, and measurement models, Iranian Industrial Training and Studies Center Press
- Madhooshi M., & Asgharnejad Amiri, M. (2008). Measurement of intellectual capital and review of its relation with financial efficiency of enterprises, *Journal of Accounting and Auditing Studies*, 57,101-116.
- Meng-Yuh Cheng, Jer-Yan Lin, Thomas W. Lin, (2008). Censoring model for evaluating intellectual capital value drivers. (639-654)., The current issue and full text archive of this journal is available at www.emeraldinsight.com/1469-1930.htm
- Namazi M., & Ebrahimi Sh. (2009). A study on the impact of intellectual capital on the present and future financial performance in companies accepted in Tehran Stock Exchange Organization TSEO, *Journal of Auditing and Accounting Studies*, 4., 1-22.

- Pew Tan H. Plowman, D. & Hancock P. (2008). Intellectual Capital and financial returns of companies. *Journal of Intellectual Capital*, 76-95.
- Riahi- Belkaoui, A. (2003). Intellectual capital and firm performance of US multinational firms: a study of the resource -based and stakeholder views, *Journal of Intellectual Capital*, 2, 215-26.
- Rudez, H.N & Mihalic, Tanja (2007). Intellectual Capital in the hotel industry :A case study from Slovenia, *Hospitality Management*, 26., 188-199.
- Sakar, B .(2007). A study on efficiency and productivity of Turkish banks in Istanbul Stock Exchange using Malmquist DEA, *Journal of American Academy of Business*, 145-155.
- Santanu, G. & Amitava, M. (2009). Indian software and pharmaceutical sector IC and financial performance, The University of India, West Bengal, Burdwan, Burdwan, www.emeraldinsight.com/1469-1930.htm
- Taheri, A. (1998). Methodology and bibliography, Tehran Payam-E-Noor University (PNU), 7th Ed.
- Wadden, J. B.(1999). CFROI Valuation; A TOTAL System Approach to Valuing to Firm, Butterworth-.Emerald insight.com/1369-1731.htm
- Wang, J.C. (2008). Investigating market, value and intellectual capital for S&P 500, Vol. 9, The current issue and full text archive of this journal is available at www.emeraldinsight.com/1469-1930.htm
- Williams, S. Mitchell (2000). Is a Company's Intellectual Capital Performance and Intellectual Capital Disclosure Practices Related? Evidence from Publicly Listed Companies from the FTSE 100. Working Paper Presented at McMasters Intellectual Capital Conference, Hamilton Ontario.
- Yalam, A. (2005). Intellectual Capital, Performance of quoted banks, *Istanbul Journal of Stock Exchange Market*, 256-271.