The Investigation of the Relationship Between Intellectual Capital and Economic Value Added and Created Shareholder Value in Listed Companies of Tehran Stock Exchange

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Abstract: The present study aims at the investigation of the relationship between intellectual capital and Economic Value Added and Created Shareholder Value in listed companies of Tehran Stock Exchange during five years from 2007 to 2011. In this regard, intellectual capital, economic value added, and Created Shareholder Value variables to assess companies’ firm size variable as the control variable have been utilized. In this study, GLS method with the help of Eviews software has been used to estimate regression line. Moreover, to examine the amount of linear regression between variables under consideration, Pearson linear correlation coefficient has been employed. Out of 325 companies listed in Tehran Stock Exchange, some companies have been eliminated through systematic elimination and 120 companies remained sample population stratified sampling. The results indicate that there are significant relationships between dependent variable of Created Shareholder Value and independent variable of intellectual capital and economic value added.

Key words: Intellectual capital, economic value added, Created Shareholder Value.

INTRODUCTION

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

Research Literature:

Edwinson (1996) is one of the pioneering scholars in intellectual capital studies. He described the difference between market value and book value as the intellectual capitals value. Chin Cho & et al (2005) used Palic's model of intellectual capital value added (2000) as the criterion for measuring intellectual capital and by administering the regression model showed that higher intellectual capital in the companies will result in improving the financial performance and market value of the stocks of the companies. Nahandi & et al (2012) studied the relationship between corporate governance structures and the coefficient of economic value added to human capital. The results show that there is a positive and meaningful relationship between the variables of the number of members of the board of directors, size and profitability and human capital. The research results by Anwari-e-Rostami showed that intellectual capital has a high correlation with stock's market value. Esmaelzadeh-e-Magharri (2010) studied the relationship between intellectual capital and the profit before taxation interest, operational cash flows and value added. The research results approved that there is a meaningful and positive relationship between intellectual capital and value added in companies. Rezaee&Ebanejhad (2011) studied the descriptive power of the value created by the help of the intellectual capital pattern and surplus profit. The results showed that there is a meaningful and positive relationship between intellectual capital pattern and the value created for th stockholders. Also from among the performance

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patterns based on surplus profit, only economic value added has a positive and meaningful relationship with the value created for the stockholders. In the level of %95 of assurance, the identification power of intellectual capital is more than economic value added. Additionally, these results showed that the usefulness of utilizing the pattern of measuring intellectual capital regarding CIV (Calculated Intangible Value Pattern) method is more compared to Palic.

Research Methodology:

This research is applied and uses ex-post facto approach. The sample population of this study is all the companies listed in Tehran Stock Exchange in the period 2007 to 2011. The companies which have the following conditions have been included in the sample population:
- Their financial years should be at the end of March and no changes should occur during the studied time period.
- During the period of review, the companies should be active continuously and their shares should be traded importantly without interruption.
- Information required for research should be presented completely within the given period.
- They should not be among investment firms, financial intermediation, leasing, and bank.
- They should not lose money during the period of study and the company’s book value (shareholders’ rights) should not be negative.

In order to gather information about components and different aspects of research model, relevant theoretical information has been provided according to the library information, journals, articles, and Internet sites and required financial data have also been extracted from Tehran Stock Exchange databases and site of Islamic Development Management Studies.

To analyze data statistically and test research hypotheses, Descriptive and Inferential statistics were used. To test hypotheses after calculating Descriptive Statistics of research hypotheses, the relationships between independent and dependent variables utilizing the Fisher distribution are measured. In this study, GLS method is used to estimate regression equation. To determine the necessity of utilizing the regression line equation to explain and also possibility of generalizing the results to the community, the significance of correlation coefficients should be tested and for this purpose T-test was run. P-value was also used to assess the significance of correlation coefficients. If the calculated p-value is larger than the given error level, the achieved coefficient is not significant and the null hypothesis cannot be rejected, and if it is smaller than the given error level, the calculated coefficient is significance and the null hypothesis is rejected. The coefficient of determination and the refined coefficient of determination were utilized to describe and consider the correlation between research variables related to each other. Furthermore, Durbin-Watson test is used to determine serial self-correlation relevant to disturbing components residual data. In order to explore the effect of firm size as the control variable on estimating the dependant variables, Wald test is employed to measure its effect on the total regression equation.

Created Shareholder Value (CSV):

If the rate of return of investor is greater than expected rate of return, value of invested asset is more and more wealth is created. This increment is referred as shareholder’s created value (CSV). This criterion is one of the methods of assessing and determining the value of the company that is proposed by Fernandez (2001). In general this criterion indicates that a company creates value for shareholders if return of shareholders is more than their expected return. Or in other words a company at the end of the financial year creates value for its shareholders that its created value is more than predicted value (Bradaran-e-Hassanzadeh et al., 2012).

Economic Added Value (EVA):

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

Intellectual Capital (IC):

Intellectual capital is the difference in value between tangible assets (physical and financial) and market value. This contrasts with physical and financial forms of capital; all three make up the value of an enterprise. Measuring the real value and the total performance of intellectual capital's components is often a critical part of running a company in the knowledge economy and Information Age, to optimize the stock price using the leverage of intellectual assets.
Intellectual Capital is Normally Classified as Follows:

**Human capital**, the value that the employees of a business provide through the application of skills, know-how and expertise. Human capital is an organization’s combined human capability for solving business problems. Human capital is inherent in people and cannot be owned by an organization. Therefore, human capital can leave an organization when people leave. Human capital also encompasses how effectively an organization uses its people resources as measured by creativity and innovation.

**Structural capital**, the supportive infrastructure, processes and databases of the organisation that enable human capital to function. Structural capital includes such traditional things as buildings, hardware, software, processes, patents, and trademarks. In addition, structural capital includes such things as the organization’s image, organization, information system, and proprietary databases. Because of its diverse components, structural capital can be classified further into organization, process and innovation capital. Organizational capital includes the organization philosophy and systems for leveraging the organization’s capability. Process capital includes the techniques, procedures, and programs that implement and enhance the delivery of goods and services. Innovation capital includes intellectual properties such as patents, trademarks and copyrights, and intangible assets. Intellectual properties are protected commercial rights such as copyrights and trademarks. Intangible assets are all of the other talents and theory by which an organization is run.

**Relational capital**, consisting of such as customer relationships, supplier relationships, trademarks and trade names (which have value only by virtue of customer relationships) licences, and franchises. The notion that customer capital is separate from human and structural capital indicates its central importance to an organization’s worth.

**Size of a Firm:**

The bankruptcy cost theory explains the positive relation between the capital structure and size of a firm. The large firms are more diversified (Remmers and others 1974), have easy access to the capital market, receive higher credit ratings for debt issues, and pay lower interest rate on debt capital (Pinches and Mingo 1973). Further, larger firms are less prone to bankruptcy (Titman and Wessels 1988) and this implies the less probability of bankruptcy and lower bankruptcy costs. The bankruptcy cost theory suggests the lower bankruptcy costs, the higher debt level. The empirical studies carried out during the 1970s, as suggested by this theory, also show the positive relation between the size of firms and capital structure (Martin and others 1988). But results of some empirical studies do not corroborate with this theoretical relation.

**Variable Definition:**

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

**EVA:**

EVA is obtained by the difference of rate of return (r) and rate of capital cost (c) multiplied at the amount of capital.

\[ EVA = (r - c) \times \text{Capital} \]

\[ EVA = (r \times \text{Capital}) - (c \times \text{Capital}) \]

Rate of stock return is calculated as:

\[ r = \frac{\text{NOPAT}}{\text{capital}} \]

\[ EVA = \text{NOPAT} - (c \times \text{Capital}) \]

where c is weighted average cost of capital.

**Created Shareholder’s Value:**

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

Rate of expected return = \( R_f + (R_m - R_f) \times \beta \)

Where CSV is created value for shareholders, TEDPix is cash return index and whole price of stock market, RF is rate of return without risk, Rm is rate of stock market return and B is defined as systematic risk (rezae, 2011).

**Research Hypotheses:**

In order to study the role of intellectual capital in the value created for the stockholders there are four main hypotheses considered. Each of them also entails four minor hypotheses including the effect of the coefficient of economic value added of intellectual capital and the coefficients of economic value added of each of the elements of intellectual capital (the capital utilized, human capital, structural capital) on the measures creating value for the stockholders.
H1: Intellectual capital affects on the created shareholder value.
H1a: Capital employed efficiency affects on the created shareholder’s value.
H1b: Human capital efficiency affects on the created shareholder’s value.
H1c: Structural capital efficiency affects on the created shareholder’s value.

H2: Intellectual capital affects on the economic added value.
H2a: Capital employed efficiency affects on the economic added value.
H2b: Human capital efficiency affects on the economic added value.
H2c: Structural capital efficiency affects on the economic added value.

Regression Models:
In order to examine the hypotheses of the study, regression models have been evaluated. 
CSV = a + b1IC + b2EVA + b3SIZE + ε

Analysis of Regression Results:

Preliminary Analysis:
Multiple regression was run in SPSS to test the set hypotheses. Before running the regression, investigation into the multicollinearity problem was carried out. First of all, bivariate correlations among the independent variables were examined to find out the multicollinearity problem.

Table 1: Summaries of basic Descriptive statistics.

<table>
<thead>
<tr>
<th>Variable</th>
<th>CSV?</th>
<th>IC?</th>
<th>EVA?</th>
<th>SIZE?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.650666</td>
<td>0.192109</td>
<td>0.856291</td>
<td>5.526841</td>
</tr>
<tr>
<td>Median</td>
<td>0.663500</td>
<td>0.157500</td>
<td>0.712000</td>
<td>5.390000</td>
</tr>
<tr>
<td>Maximum</td>
<td>2.083000</td>
<td>4.192000</td>
<td>19.988000</td>
<td>7.974000</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.060000</td>
<td>0.001000</td>
<td>0.043000</td>
<td>4.358000</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.217111</td>
<td>0.001000</td>
<td>1.074432</td>
<td>0.625137</td>
</tr>
<tr>
<td>Skewness</td>
<td>1.150410</td>
<td>1.306797</td>
<td>1.558200</td>
<td>4.789090</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>9.946150</td>
<td>237.6721</td>
<td>231.9207</td>
<td>4.789090</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>981.6175</td>
<td>1022622</td>
<td>974013.7</td>
<td>157.0534</td>
</tr>
<tr>
<td>Probability</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
</tr>
</tbody>
</table>

Table 2: The effect of the independent variables on the dependent using the total model - Panel Data Results.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.882278</td>
<td>0.280259</td>
<td>3.148086</td>
<td>0.0018</td>
</tr>
<tr>
<td>IC?</td>
<td>-0.160411</td>
<td>0.031048</td>
<td>-5.166467</td>
<td>0.0000</td>
</tr>
<tr>
<td>EVA?</td>
<td>-0.026647</td>
<td>0.006735</td>
<td>-3.956545</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Effects Specification

Cross-section fixed (dummy variables)

| R-squared | 0.749894 | Mean dependent var | 0.650666 |
| Adjusted R-squared | 0.682669 | S.D. dependent var | 0.217111 |
| S.E. of regression | 0.122303 | Akaike info criterion | -1.177691 |
| Sum squared resid | 5.175489 | Schwarz criterion | -0.304608 |
| Log likelihood | 353.0921 | Hannan-Quinn crit. | -0.833259 |
| F-statistic | 11.15497 | Durbin-Watson stat | 1.751661 |
| Prob(F-statistic) | 0.000000 |

Notes: Dependent variable: CSV; Method: GLS (cross-section weights); White heteroskedasticity consistent standard errors and covariance
Table 3: Characteristics of Capital Structure - Regression Results.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficients</th>
<th>S.E</th>
<th>t- statistic</th>
<th>p- value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-.322</td>
<td>.280256</td>
<td>-18.506</td>
<td>0.000</td>
</tr>
<tr>
<td>IC</td>
<td>-.408</td>
<td>.031042</td>
<td>-8.884</td>
<td>0.000</td>
</tr>
<tr>
<td>EVA</td>
<td>-.172</td>
<td>.00673</td>
<td>-3.735</td>
<td>0.000</td>
</tr>
</tbody>
</table>

R² = .66
Adjusted R² = .65
Durbin-Watson stat= 1.964

*significant at .05 level using a two-tailed test.

According to TABLE2 AND TABLE3 independent variables of our model are statistically significant at 5 per cent. The F-statistic proves the high explanatory power of the estimated model and the high R² (adjusted) indicates that the estimated model explain the 65 per cent of the size in the dependent variable.

**Conclusions:**

Intellectual capital is considered as one of the main drivers of the organization value and an important and effective element of gaining companies’ competitive advantage and superior financial performance. Nowadays, intangible asset of economy is based on intellectual capital and the essential need of intellectual capital is knowledge and information. The current study provides the empirical evidence indicating the existence of positive and significant correlation between intellectual capital and Created Shareholder Value and economic value added. Today knowledge has changed to be the most important capital and it is an alternative for physical capitals especially in competitive and technological environments. Thus, the concept of intellectual capital has gained important and broad applications. Intellectual capital is realized in customers, processes, information, trade mark, human resources and organizational systems and has a considerable role in creating consistent competitive advantages. In the present research and regarding the importance of intellectual capital in creating value for the company and stockholders, we have studied the effect of the coefficient of intellectual capital's economic value added on the performance measures based on firms' value added. Findings of the present research are consistent with Buntis et al. (1999) finding strong relationship between intellectual capital and business performance, Riahi-Belkaoui (2003) indicating a relatively strong and direct relationship between intellectual capital and companies’ performance according to the rate of return of assets, Shiu (2006) claiming positive correlation. Asadi, Trends in Social Science, 2(1), 2012, between intellectual value added coefficient and profit and market value, Tan et al. (2007) suggesting positive relationship between intellectual capital, company’s performance and future performance of the company, Bejer (2008) showing relationship between the quality of intellectual capital and survival and continuity of operation of companies with technology, Nik Muhammad (2009) demonstrating positive and significant relationship between intellectual capital and performance of financial companies through measures of profitability and ROA, Kimura et al. (2009) suggesting positive and strong relationship between intellectual capital and value creation using ROA standard, Cruz Basso et al. (2009) indicating positive and significant relationship between intellectual capital and value creation, Nikomaram, Yari, and Eshaghi (2009) showing important relationship between intellectual capital and company’s performance according to net income criteria, ROE, ROI, and EVA, Nogueira et al. (2010) indicating relationship between intellectual capital components and value added but customer capital, Kalyta (2011) demonstrating increase in Tobin's q, stock returns, and stock prices with increase in the number of scientists on the company’s board of directors, Ibraimi (2011) suggesting relationship between intellectual capital and the acquisition of new business opportunities and increased competitive advantage. On the other side, Hemati and Mehrabi (2011) on Solar demonstrated lack of relationship between growth rate of intellectual capital and company’s future performance and Shiu (2006) illustrated negative correlation between productivity (asset turnover ratio) and intellectual value added coefficient.

**Limitations of the Study:**

Some factors affect the outcome of the study which are not under the researcher’s control such as political conditions, capital market position, financial crisis, fluctuations in the major economic indicators, and the type of industry. Furthermore, other limitations of the study are lack of easy access to financial statements, covering notes, companies’ general meeting announcements which cause impossibility of doing some refinements in calculating the cost of capital, impossibility of calculating day’s value of long-term debts because of lack of an organized market to determine market interest rate of debts, and unavailability of adequate information such as conditions of obtaining long-term loans, guaranteed rate, conditions and exact time of repayment which make it difficult to calculate market value of long-term debts.

247
REFERENCES


