The relationship between Intellectual Capital and Profitability in Tehran Stock Exchange (TSE)

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ABSTRACT: Since financial accounting is unable to explain the gap between a company's value and its ledger values extensive research has been done into intellectual capital. The intellectual capital of each firm plays essential part in the modern approach to create value. In this research approach to of intellectual property of typical active companies in Tehran Exchange was calculated for a five-year period from 2003 to 2007, then the relationship between the value of intellectual capital and profitability of the companies under study was assessed. The findings of the research showed that there is a positive significant relationship between the intellectual property and the equity. The results also suggest a positive, significant relationship between the intellectual capital and the rate of asset yield.

Key words: intellectual capital, human capital, structural capital, relation capital, profitability

INTRODUCTION

Nowadays companies are in a transitional state between industrial economy and knowledge-based economy. Knowledge-based economy is the economy in which the main factor for creating wealth is the generation knowledge and its optimal use (Pack, 2005) in such economy. The intellectual capital not the physical one is viewed by many companies as the most important capital. It also plays a very important role in the creation of value for companies because they can draw on intellectual capital to strengthen and improve their performance (Mere et al., 2003).

The related literature shows that there is no single definition for the intellectual capital. According to IASB, intellectual capital includes the non-financial fixed assets that are not financial by nature but are recognizable and controllable by companies. Based on such definition, the intellectual capital mainly includes patents, trademark, and good will. Stewart (1997) holds that intellectual capital covers knowledge, information, intellectual property, and experience, which can be used for wealth creation. The intellectual capital consists in the collective mental factuity or key knowledgas a set. Broking defines intellectual capital as a market assets, human-based, infrastructural and intellectual assets. Stewart and co-workers (2001) consider the intellectual capital as the difference between the market value and value of a firm. According to WennBaren's definition, the intellectual capital of an organization includes the employees' skills, organizational processes, and the value of communication with clients. Therefore, intellectual capital does not include financial assets. Intellectual capital is the property that measures an organization's ability to generate wealth. This asset is not concrete and physical by nature but is an unintelligible asset that has been obtained through the employment of the assets related to human resources, organizational performance and the relationships outside the organization. All such characteristics help to create value which can not be sold or bought because it is a totally intrinsic phenomenon (Ros and Barons, 2003). The intellectual capital includes all the non-physical and non-monetary resources which are totally or relatively controlled by organizations, and create value for them (ibid).

Furthermore, based on Edwinson and Malen (1997) the surplus of company market value over its ledger value is termed as intellectual capital problem statement and Theoretical Framework. Although there are different views on the definition of the capital intellectual, in recent years an approximate agreement has appeared regarding the division of the components of intellectual capital. According to this agreements, the intellectual capital is composed of communication capital, human capital, and structural capital.

Communication capital (clients): The main subject of communication capital, lies in the knowledge available for creating marketing channels and communication with clients. It is a main determinant in the conversion of intellectual capital into market value, and therefore in the performance of an organization's business.
Human resource of an organization includes skills, problem solving ability, expertise, and leadership styles (Brooking 1996). Structural (organizational) capital. This capital covers the databases, organizational charts, operational instructions for processes, strategies, and executive programs.

The literature suggests a relationship between the intellectual capital and the performance of companies (Moridis 2004, Ting and Linn 2009). Merr and co-workers (2003) demonstrated that the value of the company is often based on the unintelligible intellectual capital owned by the company. Therefore, it is expected that efficacy of intellectual capital affects the performance of companies in a direct way (Tom et al., 2007). The investigations done differ in nature such that some studies have found a positive significant relationship between the intellectual capital (or its components) and the company's performance but some others support a negative relationship. For example, Moridis (2004), found that the Japanese banks that have better performance are those which have made the most use of their intellectual capital. On the other hand, Bonitz and co-workers (2002) proved a positive relationship between the structural capital and the performance of companies in Malaysia. They, therefore, concluded that investment in intellectual capital could result in the enhancement of competitive advantages for companies. In addition, investment in human resources leads to the improvement of structural capital which can, in turn, be influential in the performance of companies directly.

**Literature Review**

Mahmoud and Ismail (2009) carried research into intellectual capital in Malaysia under performance. They sought to investigate the efficacy of intellectual capital and its effect on a company's performance. They used the data collected from 18 active companies in the financial sector in 2007. The analysis of the research hypotheses showed that the banking sector relies more on intellectual capital compared to broking companies and insurance firms. They also found that there is a positive, significant relationship between the intellectual capital and the company's performance (measured by ROA and profitability).

Kumath (2008) selected active firms in India Exchange For research and studied the relationship between the intellectual capital and company's performance. He intended to determine the relationship between the intellectual capital components and the company's performance based on the traditional criteria including profitability, market value, and productivity of companies.

In (2008) Gen and Saleh carried research into intellectual capital and company's performance in Malaysia. They drew on correlation and regression. The results showed that companies continued to rely much on their physical capital, and that the efficacy of intellectual capital is still the main effective variable in the profitability of a firm whereas human resource is of great importance in the improvement and increase in its productivity. Finally, the results showed that the value of intellectual capital could account for the profitability and productivity of a firm but it couldn't explain the market value.

Following their studies to evaluate the relationship between the intellectual capital and performance indices, Penny et al. (2007) concluded that intellectual capital components affect the performance of companies.

Tom et al. (2007) investigated 150 firms active in Singapore Exchange from 2000 to 2000 to specify the relationship between the intellectual capital and financial yield. They used the added value coefficient of intellectual capital to evaluate its effect on the yield ratio of owner's equity and each share's profit, and the annual yield of shares. The results showed that:

a) There is a positive, significant relationship between the intellectual capital and company's performance
b) There is a positive relationship between the intellectual capital and the future performance of a company and

c) There is a positive, significant relationship between the growth rate of intellectual capital and the future performance of a company.

Jean et al. (2006) investigated the intellectual capital and the performance of institutes in China. They used the added value coefficient model of intellectual capital to calculate such capital. They then considered the relationship between intellectual capital and company's performance, and found that intellectual capital has a very important effect on company's performance.

Yang et al. (2006) investigated the relationship between intellectual capital components and value (performance). They concluded that:

1. There is a positive, significant relationship between the intellectual capital components (elements) and company's performance
2. Increase in intellectual capital is dependent on the process of value creation and its strategic accumulation in organizations.

Chen et al. (2005) considered the relationship between intellectual capital value coefficient and performance to companies in Taiwan, during the period from 1999-2002. They drew on four criteria to measure performance. The results showed that there is a positive, significant relationship between intellectual capital components (elements) and performance.

Gen (2003) carried an analysis on human capital which plays a key role in profitability, liquidity, developmental and operational capacity of a performance concluded that human capital is a key factor in the improvements of a company's performance.
Riahibalkui (2003) investigated the effect of intellectual capital on company's performance using the number of requests for the maintenance of trade marks by companies. The criterion for the measurement of company's performance was the ratio of added value to the total sets. The period under study covered the years from 1992 to 1996 for 81 active firms in the United States. The hypothesis analysis showed there is a positive, significant relationship between the intellectual capital and company's performance.

Shahai and KhalafElahi (2010) investigated the effect of intellectual capital on the performance of the branches of Sepah Bank in Tehran. They intended to consider the effect of the intellectual capital components including human, structural and client capitals on an old state-run bank in. The results showed that the intellectual capital component have a positive effect on the performance of the bank, and the highest effect goes to the client capital, then stand structural and human capitals.

Abbasi and Sadeghi (2010) considered the effect of intellectual capital indices including the efficacy of human, physical, and structural capitals on the financial performance of companies (dividened, the yield rate of owner's equity and the annual yield rate) for 99 companies from 2000-2003. The results showed that companies with higher intellectual capital enjoy better financial performance.

Madhoushi and NejadAmiri (2009) measured the intellectual capital and considered its relationship with the financial yield of companies. They first calculated the intellectual capital of the companies under study in the six-year-long period from 2001 to 2006. They then evaluated the intellectual capital value and the financial yield. The findings suggest a positive, significant relationship between the intellectual capital and financial yield, and the future financial yield, and the growth rate of the oncoming financial yield of companies.

Not all the investigations support the positive, significant relationship between intellectual capital and company's performance. (Favor and Williams (2003), Shiv (2006), and Chan (2009) all found that human capital has a negative effect on the ratio between the assets flow and value. This effect shows that use of human capital and resources has led to the weakening of company's performance.

Hypothesis

To answer the research questions two main hypothesis were developed. They both were tested on all the company's in the research population. They hypothesis were formulated as follows:

Hypothesis 1: There is a significant relationship between the intellectual capital and the yield of the owner's equity.

Hypothesis 2: There is a significant relationship between the intellectual capital and the yield rate of assets.

Population and the selection

The population consists of all the company's accepted in Tehran Exchange and stock market. To determines the sample under study, the companies were selected which:

1. End of their fiscal year is on March 19.
2. They were active in the exchange from 2003 to 2007.
3. No change was observed in their fiscal year from 2003 to 2006.
4. The required information regarding the company is accessible.

Using the above-mentioned conditions and randomized sampling, 58 companies were selected to form the research sample.

The calculation of variables

The independent in the present research includes intellectual capital (IC). IC means the difference between the market value and ledger value of a company (Edwinson and Malon 1997). To calculate IC value, the following relation was used:

\[ IC = \text{market value of a firm} - \text{its ledger value} \]

If IC is lower than zero, the intellectual capital value of the company will be negative. If IC is higher than zero, the intellectual capital value of the firm will be positive. And if IC equal zero, it means that the firm has no intellectual capital.

In this research, the dependent variable is the company's performance which is measured using the following criteria.

Return (yield) of owner's equity (ROE). This ratio indicates the efficacy of common owner's equity which shows the profit of the company for each one rial of owner's equity.

ROE is obtained by dividing the net profit on the total owner's equity.

Rate of assets yield (Return). This ratio indicates the efficacy of the use of assets and shows the profit for each one rial investment in the company.

ROA is obtained by dividing the net profit on the total assets.
Data Collection

The research was of correlational design. It dealt with actual data of the companies under study. To provide the information on Financial statements of the accepted companies in Tehran Exchange CDs information website of Tehran Exchange etc. were used. To process the data, SPSS software was used.

Data Analysis

In Correlation investigation like the present research, it is tried to determine or discover the relationship between different variables using correlation coefficient. Correlation coefficient serves as a criterion which explains the intensity of the relationship between dependent and independent variables. The coefficient value, in fact, specifies the percentage of the changes in dependent variable explained by the independent variable. In other words, correlation analysis is a statistic tool that measures the degree of a variable to another which is linearly related. In correlation, two criteria are discussed: determination coefficient, and correlation coefficient.

Findings

The research hypothesis tests were carried on using correlation. The obtained results are presented in the form of descriptive statistics, and the results of hypothesis test are shown in the following tables.

Table 1. Descriptive statistics

<table>
<thead>
<tr>
<th>Variables</th>
<th>std</th>
<th>mean</th>
<th>max</th>
<th>min</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intellectual capital</td>
<td>22667.60</td>
<td>503113</td>
<td>24325177</td>
<td>-954003</td>
<td>290</td>
</tr>
<tr>
<td>Return on equity</td>
<td>49.22</td>
<td>35.9570</td>
<td>427.20</td>
<td>-187.07</td>
<td>290</td>
</tr>
<tr>
<td>Return on assets</td>
<td>25.91</td>
<td>9.94</td>
<td>307.15</td>
<td>-167.69</td>
<td>290</td>
</tr>
</tbody>
</table>

The research results shows that IC mean among sample companies during the period was 503113. The average performances of companies which is measured by ROE and ROA are 35.9570 and 9.94 respectively. The last column of the table is related to the standard deviation of the variables and supports the above point.

Results from hypothesis test

1Hypothesis 1 test

Hypothesis 1: As it is shown in the following tables the correlation coefficient between the two variables of intellectual capital and ROE is 0.213 (r=0.213).

Table 2. Results of testing the hypothesis 1

<table>
<thead>
<tr>
<th>Significant Level</th>
<th>Adjusted R-squared</th>
<th>R-squared</th>
<th>Correlation coefficient</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>0/000</td>
<td>0/042</td>
<td>0/045</td>
<td>0/213</td>
<td>Return on equity</td>
</tr>
</tbody>
</table>

Since the significant level calculated in the following table is lower than 0.05 (sig=0/000), the statistic finding supports the point that there is a significant relationship between IC and ROE.

The results of the above table suggest that the intensity of the relationship between intellectual capital and ROE is 0.042. It means that 0.042 of the performance changes of the company is accounted for by intellectual capital, and the remainder is related to other variables under study.

Hypothesis 2 test

Hypothesis 2: There is a significant relationship between intellectual and ROE as it is shown in the following tables the correlation coefficient between the two variables IC and ROA is 0.161 (r=0.16). Since the significance level in the following table is lower than 0.05 (sig=0.008), the findings support the point that there is a significant relationship between IC confirmed and its null hypothesis is rejected so, it is concluded that there is a significant relationship between IC And ROA.

Table 3. Results of testing the hypothesis 2

<table>
<thead>
<tr>
<th>Significant Level</th>
<th>Adjusted R-squared</th>
<th>R-squared</th>
<th>Correlation coefficient</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>0/008</td>
<td>0/022</td>
<td>0/026</td>
<td>0/161</td>
<td>Return on assets</td>
</tr>
</tbody>
</table>

The results obtained from the above result show that the intensity between IC and ROE equals 0.022. It means that 0.022 of the performance changes of the company is explained by IC and that the remainder is related to variables under study.
This research intends to evaluate the effect of IC on the profitability of companies. The results showed that there is a positive, significant relationship between IC and the profitability of companies. This finding is in agreement with research findings in Mahmoud and Ismail (2009); Kumath (2003); pengetal (2007); Ton et al. (2007); Yang chuetal (2006); and Abbasi And Sadeghi (2010). It runs counter to findings in Fawyer and Williams (2003) and Chan (2009), because they found that use of capital and resources weaken company's performance.

In general, the results of the present research emphasise the importance of IC as an index for companies. They should establish balance between IC and physical capital in the investments.

As it was stated earlier, the IC of every company is composed of three elements (components), namely human, structural and communicational capitals. Regarding to the findings, companies should reinforce their structural capital and consequently their intellectual capital by using modern technologies, new practical methods, and increase in know-how and so forth. It is also possible to improve the relations with suppliers, clients, and competitors and increase IC. On the other hand, each company's employees increase IC through their abilities, competence, talent, and attitude. Therefore, providing essential instruction to the employees, the enhancement of their skills, and their encouragement to enhance their knowledge and education can prepare the environment for utilizing their potential abilities and improve the efficacy and productivity of the company.

They can also generate income for the company and help to develop it. Therefore, increase in the efficacy of human capital can result in the reinforcement and improvement of the performance and profitability of the company. It is suggested that Tehran Exchange calculated the IC value of the companies active in the exchange and rate them. This results in more accurate the correct valuing of the share of companies. If desired, the companies can annually present a report containing IC components accompanied by their annual financial statements.

Since the findings of the present research show a positive relationship between the IC value and profitability of companies, so it is suggested that company managers try to reinforce the IC of their organizations, so that they can increase their performance and profitability. To reinforce IC, they should pay attention all individual components of IC which includes human, structural, and communicational capitals.

REFERENCES


