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Investigating the Relationship between Intellectual Capital Efficiency and Corporate Performance in Accepted Firms of Tehran Exchange

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Abstract

The increasing gap between market value and book value of firms leads many researches to recognize removed factors of financial statements in the firms. Among factors affecting firms but not represented in financial statements, there are brand equity, intellectual capital etc. This study aims to investigate the relationship between intellectual capital efficiency and corporate performance in accepted firms of Tehran Stock Exchange. Statistical population included 111 firms whose financial information was available from 2006 to 2011. According to performance evaluation measures in previous researches, return of asset (ROA), return of equity (ROE), and return on sale (ROS) explain financial measures of performance evaluation and Tobin Q, market value added (MVA), and economic value added (EVA) are economic performance evaluation measures. Next, to examine intellectual capital's components (human capital, structural capital, and communicative capital) as independent variables, added value coefficient of intellectual capital proposed by Pulic (2000) was used. Correlation and regression tests were used to test hypotheses. The findings of tests showed that there is a positive and significant correlation between intellectual capital's efficiency and firms' performance.

Keywords: Communicative Capital, Financial Performance, Human Capital, Intellectual Capital, Structural Capital.

Introduction

In recent years, competitive advantage has been the focus of competitive strategies and many hot debates have been conducted on this issue (Tsai et al., 2008). To improve performance and face with competitors, firms should have competitive advantage to gain higher performance in complex conditions of today, preserving their position in the market. Lately, not only competition's sensitivity but also its nature has changed. Since, the focus of companies for gaining higher performance and competitive advantage has shifted from investments on tangibles to intangibles (Ramaswami & Srivastava, 2009). Intellectual capital is one of intangibles like innovation and customer capitals (Chang, 2004). Nowadays, creating value and innovation are noticed by managers, investors, economic agents, and government.

Many firms invest on staff education, research and development, customer relations, administrative and computer systems, and etc. Such investments called intellectual capital are growing and even exceeding financial and physical investments. This change in investment structure has been attributed to knowledge. The main source of value creation is intellectual capital in modern economy (Zeghal, D, & Maaloul, 2010). Traditional accounting model concentrates on financial and physical assets, ignoring intellectual capitals. The lack of accounting recognition about intellectual capital and its role in creating value causes financial statements not revealing values for stockholders and other users (Chang, W & Hsieh, J, 2011).

This study aims to investigate the relationship between intellectual capital's efficiency and corporate performance in accepted firms of Tehran Stock Exchange to provide the guides for the companies who need to know about the value of their performance to use knowledge of economy and intellectual capitals for value creation.

Methodology

Theories

Theoretically, intellectual capital is based on strategic resources. This theory states that companies gain high financial efficiency and competitive advantage through achieving, maintenance and effective usage of strategic resources. Thus, as a strategic resource, human capital allows companies to create value added (Riahi Belkaoui, 2003). In late 1990s, management scholars tried to define and categorize components of intellectual capitals (Edvinsson & Malone, 1997). Intellectual capital is defined as a knowledge that can turn into value. They divided intellectual capital into human capital, Communicative capital and structural capital, known as the most famous categorizations in this field (Ashton, 2005).

Human capital reveals implicit knowledge in the minds of staff. It is an important source of innovation and creation in an organization, defined as a combination of qualities and thinking trend of the staff (Pew Tan, 2005). Staff creativity enables them to use their knowledge and innovation continuously and innovation improves business processes and new services, leading to competitive advantage (Abeysekera, 2008). Communicative capital refers to the knowledge value lied in marketing channels in an organization that is created by business trends (Lopez, 2008). This capital has higher direct effects on gaining corporate value and has increasingly turned into an important factor in business (Chen et al., 2004). Thus, customer capital makes the company connected to competition, enabling companies for competition (Louis & Chyan, 2004). Structural capital can be regarded as a culture, organizational structure, operational processes, and information systems. An organization with strong structural capital can provide good conditions for utilizing human capital, allowing it to be used optimally to absorb customers and produce new goods (Lopez, 2008).

There are enough evidences of positive effect of intellectual capital on corporate performance. Chen et al. (2005) showed positive correlation of intellectual capital on corporate performance and market value. Thus, the more companies devote capital and resources for managing their intellectual capital, the higher they improve their intellectual capital and corporate performance.

Operational Definition of Variables

Coefficient of value added of intellectual capital (Pulic model)

Here, intellectual capital 's elements (i.e. structural capital, human capital, and communicative capital) were regarded as independent variable and model of value added of intellectual capital (Pulic model) was used for measuring intellectual capital.

Pulic model has 5 stages as follows:

Value added identification

Based on stakeholders' view, value added is estimated as: $VAi=OUT-INVA_i$

Determining used (Physical or financial) capital: $CEE_i = \frac{VA^i}{CEi}$

Where CE_i is net book value of assets in firm i.

Identifying efficiency of human capital $HCE_i = \frac{VAi}{HCi}$

Where, HCi is total invested sum for wages in firm i.

Identifying efficiency of structural capital $SCE_i=\frac{SC^i}{VAi}$ $Sc_i = VA_i - HC_i$

Identifying coefficient of intellectual value added $VAIC_i=CEE_i+HCE_i+SCE_i$

where,

$VAIC_i$: value added coefficient of intellectual capital for company i

CEE_i : value added coefficient of communicative capital for company i

HCE_i : value added coefficient of human capital for company i

SCE_i : value added coefficient of structural capital for company i

ROA: It results from dividing net profit into total assets in the company.

Market value added (MVA): MVA=A-B

Where,

A: mean of market value of stockholders' equity during year

B: mean of book value of stockholders' equity during year

Economic value added $EVA = (roic - wacc) * ic$

Tobin Q :

$$\text{Tobin Q} = \frac{\text{Total debts book value} + \text{value of common stocks at the end of year}}{\text{Total assets value at the end of year}}$$

ROS: It results from dividing earnings after tax into sale.

ROE: ROE results from dividing net earnings into stockholders equity.

Company size: To measure company size, Neperian logarithm of total assets is used.

Financial leverage: Financial leverage results from dividing Total debts' book value into total assets

Systematic risk: β is used for measuring systematic risk. It equals covariance of stock return multiplied by market portfolio return divided by market portfolio variance.

Hypotheses

There is a correlation between intellectual capital and ROA.
There is a correlation between human capital and ROA.
There is a correlation between structural capital and ROA.
There is a correlation between communicative capital and ROA.
There is a correlation between intellectual capital and ROE.
There is a correlation between human capital and ROE.
There is a correlation between structural capital and ROE.
There is a correlation between communicative capital and ROE.
There is a correlation between intellectual capital and ROS.
There is a correlation between human capital and ROS.
There is a correlation between structural capital and ROS.
There is a correlation between communicative capital and ROS.
There is a correlation between intellectual capital and EVA
There is a correlation between human capital and EVA.
There is a correlation between structural capital and EVA.
There is a correlation between communicative capital and EVA.
There is a correlation between intellectual capital and MVA.
There is a correlation between human capital and MVA.
There is a correlation between structural capital and MVA.
There is a correlation between communicative capital and MVA.

There is a correlation between intellectual capital and market value of the company.
There is a correlation between human capital and market value of the company.
There is a correlation between structural capital and market value of the company.
There is a correlation between communicative capital and market value of the company.

Statistical population and sample

Statistical population of the study included all accepted firms in Tehran Stock Exchange. The companies with the following conditions were selected as the sample: *1.* They were manufacturing, *2.* Their fiscal year ended to last month of winter without any change in it during study years, *3.* They were accepted in Tehran Stock Exchange before 2006, *4.* Their financial information was available, *5.* They were profitable during study years.

Regarding above conditions, 111 firms were selected as the sample.

Method of Research

This study is casual and post event with applied goals. To test normality of the variables, Kolmogrov-Smirnov test was used. To analyze data, descriptive statistics including correlation analysis and multiple regression method were used.

Results and Discussion

Results

H1 test results:

Regarding H1, at 5% significance level, the effect of value added of human capital and communicative capital on ROA is positive. While, there is a negative correlation between structural value added and ROA. Thus, H1 is confirmed at 95% confidence level. There is a positive and significant correlation between efficiency of intellectual capital and ROA of studied companies. Thus, the more companies devote their resources and efforts to managing their intellectual capital, the better they improve their return on assets, performance and competitive advantages. Also, financial leverage and company size are positively and significantly correlated with ROA. But, there is no correlation between systematic risk and ROA. Considering determination coefficient, independent variables including value added of human capital, structural capital, and communicative capital explain 0. 49, 0.39, and 0.64 of changes in ROAs of companies.

H2. Test results:

Regarding H2 results, at 5% significance level, the effect of value added of human capital and communicative capital on ROE is negative. While, there is a positive correlation between structural value added and ROE. Thus, H2 is confirmed at 95% confidence level. There is a negative and significant correlation between efficiency of intellectual capital and ROE of companies. Thus, companies should improve their intellectual capital to improve their performance. If studied companies can't provide good conditions for utilizing capabilities of human capital, their staff efficiency decreases. Also, financial leverage and company size are positively and significantly correlated with ROE. But, there is no correlation between systematic risk and ROE.Considering determination coefficient, independent variables including value added of human capital, structural capital, and communicative capital identify 0.32, 0.15, and 0.53 of changes in ROE of companies.

H3 test results:

Regarding H3 results shown, at 5% significance level, the effect of value added of human capital and communicative capital on ROS is positive. While, there is a negative correlation between structural value added and ROS. Thus, H3 is confirmed at 95% confidence level. There is a positive correlation between efficiency of intellectual capital and ROS of companies. Thus, intellectual capital has the key role in decreasing cost reduction. Also, financial leverage and company size are positively and significantly correlated with ROS. There is no correlation between systematic risk

and ROS. Considering determination coefficient, independent variables including value added of human capital, structural capital, and communicative capital identify 0.41, 0.32, and 0.32 of changes in ROS of companies.

H4 test results:

Regarding H4 results, at 5% significance level, the effect of value added of human capital and communicative capital on EVA is positive. While, there is a no correlation between structural value added and EVA.Thus, H4 is confirmed at 95% confidence level. There is a positive correlation between efficiency of intellectual capital and EVA of companies. Thus, the more companies devote their resources and efforts to managing their intellectual capital, the better they improve their performance and competitive advantages. Thus, intellectual capital has the key role in value creation for stockholders. Also, financial leverage and company size are positively and significantly correlated with EVA. There is no correlation between systematic risk and EVA. Considering determination coefficient, independent variables including value added of human capital, structural capital, and communicative capital identify 0.12, 0.11, and 0.16 changes in market value of companies.

H5 test results

Regarding H5 results, at 5% significance level, the effect of value added of human capital and communicative capital on market value added is negative. Thus, H5 is confirmed at 95% confidence level. There is a positive correlation between efficiency of intellectual capital and market value of companies. If the firms improve organizational capabilities and consider satisfaction of customers, competitive advantage and company value increase. Also, financial leverage has a positive correlation with market value added while there is a negative correlation between financial leverage and market value added. There is no correlation between systematic risk and market value added. Considering determination coefficient, independent variables including value added of human capital, structural capital, and communicative capital identify 0.23, 0.13, and 0.27 of market value of companies.

H6 test results:

Regarding H6 results, at 5% significance level, ratio of value added of human capital and communicative capital to Tobin Q of companies is negatively correlated. Thus, H6 is confirmed at 95% confidence level. There is a positive correlation between efficiency of intellectual capital and Tobin Q of the companies. Then, intellectual capital can help firms in creating and sharing knowledge as one of organizational capabilities. It can create constant organizational advantage and significantly affects organizational performance. Company size has a negative and significant correlation with Tobin Q of studied companies. But, systematic risk and financial leverage are not correlated with Tobin Q of companies. Considering determination coefficient, independent variables including value added of human capital, structural capital, and communicative capital identify 0.13, 0.06, and 0.18 of Tobin Q of companies.

Discussion

This study attempted to use value added of intellectual capital for evaluating the effect of intellectual capital on company performance. According to the results, intellectual capital has a positive and significant correlation with economic performance. Intellectual capital has an important role in reducing production costs. This finding agrees with Zegal and Malol (2010) who concluded positive effect of intellectual capital on economic performance. Thus, intellectual capital has the key role in value creation for stockholders. This result agrees with Bekoyi (2003), Tan et al. (2007), Zegal and Malol (2010), Namazi and Ebrahimi (2011).Tehran Stock Exchange highly emphasizes achieved return from human resources and shows negative reaction to the companies which don't use their human assets efficiently. Tehran market pays less attention to structural capital compared

with physical and human capitals. In other words, structural capital has a negligible role in determining market value. Using company data, a positive and significant correlation was found between value added coefficient of intellectual capital and economic and financial performance of companies. This implies that intellectual capital has the key role in value creation for stockholders and cost reduction; as a result, stockholders consider intellectual capital as value creation resource.

Conclusion

Managers and stockholders should consider human and communicative capitals which are positively correlated with most performance measures to improve value added and company performance and suggested to regard structural capital which is negatively correlated with most performance measures and identify reasons of its negative and weak effect to pave the way for better utilization of intellectual capital in the organization. Company managers should consider improvement of structural capital. Structural corrections, process corrections, considering executive rules of operational programs, strategy improvement, infrastructure modifications, and improvement of business methods using brands, innovations, and discoveries are effective in improving structural capital and can help promoting financial performance measures of companies in future.

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