Measuring the level of intellectual capital and studying its effect on firm value by using the Q-Tobin model for companies accepted in Stock Exchange in Tehran

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ABSTRACT: The rise of the “new economy”, one principally driven by information and knowledge, is attributed to the increased prominence of intellectual capital (IC) as a business and research topic. Intellectual capital is implicated in recent economic, managerial, technological, and sociological developments in a manner previously unknown and largely unforeseen. As the gap between firm value and book value of company's increases, various researches about recognition of factors eliminated from the financial statements have been performed and developed. Value and the level of intellectual capital in organizations is one of the effective components on firms' value, but it isn't presented in financial statements. The present research aims at not only measuring the level of intellectual capital and firms' value, but also studying the effect of intellectual capital on firm value. Statistical universe of this research is the companies accepted in Stock Exchange in Tehran. This research has been carried out among 132 companies accepted in Tehran Stock Exchange between 2008-2013 by Regression Analysis Method using SPSS19 Eviews6 software. Data gathering instrument in this research includes referring to financial recorded information, evidence, and backgrounds of companies in Rahavard Novin Software and Stock Exchange Organization’s website. The results obtained from this research show that there is a significant correlation between intellectual capital (as an intangible asset) and firm value. There is also a meaningful relationship between the efficiency of human, structural, and applied capital in one hand and intellectual capital in studied companies on the other hand.

Keywords: Intellectual capital, Added value coefficient of intellectual capital, Efficiency of (human or structural) capital.

INTRODUCTION

Nowadays, everyone knows that internet and world-wide web network indicates the emergence of modern age, known as “knowledge age” and valediction of industrial age. At the beginning of industrial age in 1980s, aggregate production and distribution has been emphasized. However, in knowledge era, what develops the industry and ensuring its success is human knowledge. This intangible asset is known as intellectual capital, and development of intellectual capital is the vital area of creating benefit. (1) Business environment based on knowledge needs an approach that contains organizations' new intangible assets including human resources' knowledge and competencies, innovation, communications with customers, organizational culture, systems, and organizational structure, and other features. Meanwhile, intellectual capital theory has increasingly attracted many academic researchers’ and organizational players’ attention. (2) On the other hand, most of the existing accounting systems have ignored the increased role and significance of intellectual property and knowledge's right in modern age organizations, and they are unable to evaluate the actual value of these assets in their calculation. In other words, financial statements have many limitations about description of companies’ actual value. In present knowledge-based societies, the output of applied intellectual capital has been more emphasized rather than the output of applied financial capital. (17). It means that the role and significance of financial capitals will be significantly decreased in future rather than intellectual capital, when the stable profitability is determined. This has caused the gap to be created between organizations’ and companies’ actual value and what applied in traditional accounting calculation. As the gap between firms’ actual value and their book value increases, it has remarkably attracted many researchers' attention in order to explain the invisible value that is omitted from the financial statements. A value called
intellectual capital exists in all dimensions of organization as a body of knowledge, but it is ignored. Based on the research performed among 500 Taiwanese companies, the proportion of companies' actual market value to their book value has been gradually increased more than five times between 1997-2001. Research has shown that about 80 percent of companies' market value has not been reflected in their financial reports. This research is looking for studying both the effect of intellectual capital on companies' actual value and its components' influence on companies' value.

**Theoretical literature and review of history of research**

Researches have been done regarding intellectual capital and its effect on companies' key variables and their value, and some of the most important findings about this issue are as follows:

**Foreign researches**

Berzkalne and Zelgalo (2014) have engaged with studying the relationship between intellectual capital and active companies' value in exchanges of Baltic area companies including Latvia, Lithuania, and Estonia. They have stated that the existing difference between book value and market value of companies indicates the existence of companies' intellectual capital. The results obtained from their research have shown that the added value criterion of intellectual capital has significantly correlated with company's value. (13).

Tavi and Toolington (2012) have studied the concepts and definition of intellectual capital, and they have expressed that there is no unanimous agreement about the definitions of intellectual capital. They have acknowledged the existing correlation between intellectual capital and value-creation process in companies. (14)

Chung and Hesyeh (2011) have investigated the relationship between intellectual capital's components and operational, financial, and market performance in Taiwanese exchange in Electronic Industry. A model known as adjusted intellectual added value coefficient has been used in order to measure the intellectual capital. The results indicate that operational performance has positively related to applied capital, and it has not correlated with human and structural capital. In addition, intellectual capital's components have negatively correlated with financial and market performance.

Paybourina and Golooko (2009) have focused on intellectual capital as an intangible and safe asset, and they have said that this kind of asset is applied just for companies in which the necessary background and platforms are provided in advance. Thus, these companies must seek the creation of stable development. As a result of their research, Paybourina and Golooko (2009) have expressed that intellectual capital can play the role of a major factor in long-term process of company's development.

Yung and Kung (2008) have carried out a research in Taiwan in which they studied the correlation between innovation capitals and customer asset as well as these two factors' interactive relationships with companies' financial performance considering the companies' technology. The findings of this research show that there is a significant correlation both between innovation capital and performance and between customer capital and performance. Moreover, the intensity of the correlation between customer capital and performance in high-technology companies is less than low-technology ones, and the significant interactive relationships exist just in production companies with high technology. (14).

Tan et al., (2007) have analyzed the relationship between intellectual capital and financial performance among 150 companies out of the total number of Stock Exchange companies between the years 2000 and 2002 in Singapore. The results obtained from this research were remarkable in different parts, including the existence of positive and significant correlation between these companies' intellectual capital and their financial performance and the direct relationship between intellectual capital and companies' future performance as well as development rate of intellectual capital and companies' performance. On the other hand, the proportion of intellectual capital in companies' performance is different from industry. (10).

**Researches performed in the country**

Roya Darabi (2012) has studied the impact of intellectual capital components' disclosure on the quality of financial reporting among companies accepted in Tehran Stock Exchange. To do this, a sample consists of 184 companies accepted in Tehran Stock Exchange has been investigated in chemical and pharmaceutical industries. One main hypothesis and three secondary hypotheses have been codified for this research. There is a significant relationship between intellectual capital's components and the quality of financial reporting, and human, communicational; moreover structural capital has significantly correlated with the quality of financial reporting. From the aim point of view, this research is an applied research and from the kind of research perspective is a correlation research. The results obtained from the hypotheses test of this research indicate that the effect of both communicational and human capital on dependant variable called the quality of financial reporting is positive and significant, but the influence of structural capital on the quality of financial reporting is negative. Among three components of intellectual capital, the effect of human capital on the quality of financial reporting is rather stronger. (4)
Nemamian et al., (2011) in a research known as "intellectual capital and its measuring methods" have stated that measuring the intellectual capital is based on a strategic approach from intangible assets in order to compare different companies, their actual value determination, and even improvement of their control. In this research, they have tried to study the significant, trait, different reasons and methods of intellectual capital's measurement by representing its concept and definitions as well as its constituent components including human capital, structural capital, and communicational capital. (8).

In a research called "Corporate Governance and Intellectual Capital Performance in companies accepted in Tehran Stock Exchange", Jalili and Hemati (2011) have analyzed the correlation between corporate governance and intellectual capital performance among the companies accepted in Stock Exchange in Tehran. The level of intellectual capital is a dependant variable in this research that has been measured by the "Pulic Model" of added value coefficient of intellectual capital. Independent variables of this research include the proportion (percent) of company shares maintained by major investment institutions to total issued shares under the control of shareholders, the ratio of non-executive managers of board of directors to its total members, existence (or lack) of executive manager as a chief or vice-president of board of directors, and existence (or lack) of internal auditors in company. The results of this research have shown that there is a significant correlation between existence of non-executive managers in the composition of board of directors and structural capital. In addition, a significant relationship has been observed between lack of existence of executive manager in company as a chief or vice-president of board of directors and human capital, as well as the existence of internal audit in company and both human and structural capital components of intellectual capital. (7).

Zahra Poorzamani et al., (2011) have studied about the impact of intellectual capital on market value and financial performance. Hypotheses of this research are as follows:

Market value-to-book value ratio is high in companies with high value of intellectual capital. Those companies which have high levels of intellectual capital, they will reach to high ratio of assets’ output.

The results demonstrate that there isn’t any significant correlation between intellectual capital and companies’ market value; however, the statistic results obtained from the second hypothesis show the significant relationship between intellectual capital and output ratio of company's assets. Overall results obtained from the research indicate the positive and significant impact of performance coefficient of intellectual capital on financial performance (output ratio of assets). (5).

A research known as "the impact of intellectual capital components' performance on companies' financial performance in Tehran Stock Exchange" has been carried out by Abbasi and Sedghi (2010) in which they use added value model of intellectual capital, and 99 companies have been studied by Dina Panel Regression model between the years 2000 and 2004. One of the obtained results in this research is about the positive and significant correlation between intellectual capital components with shares’ output ratio and the effect of the performance of human and physical capital on the interest in each share. (6).

**METHODOLOGY OF RESEARCH**

From the aim point of view, this research is a kind of applied research, and from the data gathering perspective, it is a descriptive one (as it results in more recognition of existing conditions and supporting the decision-making process). As the level of dependence of independent variable and dependant variable is analyzed toward each other in this research, it is a correlation research. Research method is Apriori in which theoretical bases and history of research are gathered using libraries, articles, and internet. Using the appropriate statistical methods, inductive reasoning is applied in order to generalize the results whenever we want to accept or reject the research hypotheses. Thus, this research has been done in the framework of inductive-deductive reasoning.

**DATA ANALYSIS METHOD**

In this research, the statistical universe is those companies accepted in Tehran Stock Exchange organization, and the data related to 132 companies-that our statistic sample is formed based on that and they are determined by systematic removal method- has been analyzed in the period of 2008-2013 in order to study the relationship between variables for research hypotheses test. The gathered data has been analyzed by using SPSS19 Eviews6 software. Data analysis in descriptive statistic part is performed by calculating the central indexes such as mean, median and distribution indicators like standard deviation. Then, the kolmogorov-smirnov test has been used to study the normality of variables. Pearson correlation coefficient has been applied for models analysis, and mixed and panel data analysis without or with fixed effects and with random effects has been used for integrative data. Hausman test is also used in order to specify the fitness of model with fixed or random effects.
**Research hypotheses**

The present research hypotheses have been established regarding the theoretical literature and performed studies including one main hypothesis and three secondary hypotheses as follows:

The main hypothesis: the level of company's intellectual capital has significantly affected on company's value.

**Secondary hypotheses**

There is a significant relationship between the efficiency of human capital and intellectual capital.  
There is a significant correlation between the efficiency of structural capital and intellectual capital.  
There is a significant relationship between the efficiency of applied capital in company and intellectual capital.

**Research model and its variables’ measurement**

The Q-Tobin criterion has been used as a measurement index of company's value in this research. The considered correlation is as follows:

Q-Tobin Ratio = Book value of debts + Market value of shareholders' rights / Book value of assets

Moreover, the added value coefficient of intellectual capital (VAIC) has been used as a measuring index of intellectual variable. This coefficient consists of three variables known as "human capital efficiency" (HCE), "structural capital efficiency" (SCE), and "capital employed efficiency" (CEE). The relations regarding this variable are as follows:

Relation 1: \( \text{VAIC} = \text{CEE} + \text{SCE} + \text{HCE} \)

Where the calculation method of mentioned factors is as follows:

\( \text{HCE}_{it} = \frac{\text{VA}_{it}}{\text{HC}_{it}} \)

\( \text{HC}_{it} = \) investment in human capital over one period of time or overall rights and benefits including educational and motivational programs.

\( \text{VA}_{it} = \) Added value

Relation 2: \( \text{VA}_{it} = \text{DP}_{it} + \text{W}_{it} + \text{I}_{it} + \text{D}_{it} + \text{T}_{it} + \text{R}_{it} \)

Where:

\( \text{DP}_{it} = \) Depreciation cost

\( \text{W}_{it} = \) wages and salaries

\( \text{I}_{it} = \) Total interest rate

\( \text{D}_{it} = \) divided interest

\( \text{T}_{it} = \) Corporate tax

\( \text{R}_{it} = \) Remaining interest

\( \text{SCE}_{it} = \) structural capital efficiency

Relation 3: \( \text{SCE}_{it} = \frac{\text{SC}_{it}}{\text{VA}_{it}} \)

\( \text{SC}_{it} = \) it is structural capital during a period of time (t) that is calculated based on a difference between added value and structural capital. This parameter computes the share of structural capital in the created value.

\( \text{CEE}_{it} = \) capital employed efficiency

Relation 4: \( \text{CEE}_{it} = \text{VA}_{it} + \text{CE}_{it} \)

Relation 5: Capital Employed Efficiency = Total Assets – Intangible Assets at the end of period (4)

**RESEARCH RESULTS**

Table 1 shows the descriptive statistics of research variables during the studied period. Descriptive statistics of research variables that are calculated by using data gathered in companies over test period between the years 2008-2012, are represented including mean, medium, standard deviation, maximum, and minimum.

**Normality test**

Kolmogorov-Smirnov test has been used in order to study the normality of distribution of dependant variables. This test has been performed for dependant variables. According to above table and statistics obtained from Kolmogorov – Smirnov test, as the significant level for all of the variables is more than 0.05, Zero Hypothesis(H0) is confirmed; thus it can be said by 95% certainty that the mentioned variables in above models have a normal distribution.
Table 1. Descriptive statistics of research variables (calculated based on introduced relations):

<table>
<thead>
<tr>
<th>Description of variables</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Standard Deviation</th>
<th>Mean</th>
<th>Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tobins-Q</td>
<td>4.7004</td>
<td>4.7004</td>
<td>6.2698</td>
<td>2.4706</td>
<td>2.4706</td>
</tr>
<tr>
<td>Intellectual capital (VAIC)</td>
<td>0.5212</td>
<td>0.4162</td>
<td>2.8151</td>
<td>0.3723</td>
<td>0.8611</td>
</tr>
<tr>
<td>Human Capital Efficiency (HCE)</td>
<td>0.4001</td>
<td>0.3159</td>
<td>2.1609</td>
<td>0.2858</td>
<td>0.6609</td>
</tr>
<tr>
<td>Structural Capital Efficiency (SCE)</td>
<td>0.3457</td>
<td>0.2761</td>
<td>1.8675</td>
<td>0.2470</td>
<td>0.5712</td>
</tr>
<tr>
<td>Capital Employed Efficiency (CEE)</td>
<td>0.3685</td>
<td>0.2943</td>
<td>1.9903</td>
<td>0.2632</td>
<td>0.6088</td>
</tr>
<tr>
<td>Financial Leverage (Lev)</td>
<td>0.7432</td>
<td>0.6923</td>
<td>0.7651</td>
<td>0.1987</td>
<td>0.9675</td>
</tr>
<tr>
<td>Systematic Risk (BETA)</td>
<td>2.564</td>
<td>2.4090</td>
<td>6.3212</td>
<td>2.3324</td>
<td>4.8776</td>
</tr>
<tr>
<td>Profit of Company's Each Share (EPS)</td>
<td>496</td>
<td>462</td>
<td>9.1767</td>
<td>277</td>
<td>1345</td>
</tr>
<tr>
<td>Divided Interest (DIV)</td>
<td>21.1597</td>
<td>21.0356</td>
<td>0.9528</td>
<td>19.1079</td>
<td>25.5398</td>
</tr>
</tbody>
</table>

Reference: Research findings and Researcher's calculations.

Table 2. K-S test, Normality test of distribution

<table>
<thead>
<tr>
<th>The name of variable</th>
<th>K-S Statistics</th>
<th>Significant level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tobins- Q</td>
<td>1.234</td>
<td>0.201</td>
</tr>
<tr>
<td>VAIC</td>
<td>1.554</td>
<td>0.141</td>
</tr>
</tbody>
</table>

A process of selecting a proper model

Based on existing research literature as well as the nature of research hypotheses, compound data has been applied in this research. Moreover, Chow and Hausman tests have been used in order to determine a proper model such as integrated model and panel model with stable or random effects for hypotheses test. Consequently, the results obtained from Chow test show that integrated panel model won't be confirmed. The method applied for estimating the models (stable or random effects) must be determined after we know that the value of intercept isn't the same for different years; therefore Hausman test will be used for doing so. Thus, fitness of regression models mentioned in this research by using the panel data model by random effects method will be a proper way based on the Hausman test.

Main hypothesis test

The rate of company's intellectual capital significantly affects on company's value.

Relation 6:  \( \text{Tobins}_t = \beta_0 + \beta_1 \text{VAIC}_t + \beta_2 \text{LEV}_t + \beta_3 \text{BETA}_t + \beta_4 \text{EPS}_t + \beta_5 \text{DIV}_t + \beta_6 \text{SIZE}_t + \epsilon_t \)

Null hypothesis and alternative hypothesis for model's significance are as follows:

H0: The level of company's intellectual capital doesn't significantly affect on company's value.

H1: The level of company's intellectual capital significantly affects on company's value.

According to table 3, significance level (sig) of intellectual capital variable equals 0.046 that is less than considered significance level at the present research (0.05), in addition, absolute value of t-statistics (2/231)
related to this variable is more than t-statistics obtained from the values considered in table with the same degree of freedom. Thus, null hypothesis is rejected at 95% certainty, and alternative hypothesis (H1) will be confirmed. So, the level of company's intellectual capital significantly affects on company's value.

The first secondary hypothesis test
There is a significant correlation between human capital efficiency and intellectual capital.  
Relation 7: \( \text{VAIC}_{jt} = \beta_0 + \beta_1 \text{HCE}_{jt} + \varepsilon_{jt} \)

Table 4. the results obtained from the fitness of regression equation in the first secondary hypothesis:

<table>
<thead>
<tr>
<th>Name of variable</th>
<th>Variable coefficient</th>
<th>Amount of coefficient</th>
<th>t-statistics</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant number</td>
<td>( \beta_0 )</td>
<td>0/143</td>
<td>2/776</td>
<td>0/012</td>
</tr>
<tr>
<td>Human capital efficiency (HCE)</td>
<td>( \beta_1 )</td>
<td>0/805</td>
<td>2/909</td>
<td>0/0086</td>
</tr>
<tr>
<td>Determination coefficient</td>
<td>0/821</td>
<td>F-statistics</td>
<td></td>
<td>13/843</td>
</tr>
<tr>
<td>Adjusted determination coefficient</td>
<td>0/754</td>
<td>Significance (P value)</td>
<td></td>
<td>0/00061</td>
</tr>
</tbody>
</table>

Null hypothesis and alternative hypothesis for significance of model are as follows:  
H0: There isn't any significant correlation between human capital efficiency and intellectual capital.  
H1: There is a significant relationship between human capital efficiency and intellectual capital.  

According to table 4, significance level (sig) of human capital efficiency (equal to 0/0086) is less than considered level for significance in this research (0/05); in addition, absolute value of t-statistics (2/909) related to this variable is more than t-statistics obtained from the table with the same degree of freedom. Therefore, null hypothesis (H0) is rejected with 95% certainty, and alternative hypothesis (H1) is conformed, that is, there is a significant correlation between human capital efficiency and intellectual capital.

The second secondary hypothesis test
There is a significant correlation between structural capital efficiency and intellectual capital.  
Relation 8: \( \text{VAIC}_{jt} = \beta_0 + \beta_1 \text{SCE}_{jt} + \varepsilon_{jt} \)

Table 5. the results obtained from the fitness of regression equation for second secondary hypothesis:

<table>
<thead>
<tr>
<th>Name of variable</th>
<th>Variable coefficient</th>
<th>Amount of coefficient</th>
<th>t-statistics</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant number</td>
<td>( \beta_0 )</td>
<td>0/554</td>
<td>3/998</td>
<td>0/0002</td>
</tr>
<tr>
<td>Structural capital efficiency (SCE)</td>
<td>( \beta_1 )</td>
<td>0/836</td>
<td>3/336</td>
<td>0/001</td>
</tr>
<tr>
<td>Determination coefficient</td>
<td>0/767</td>
<td>F-statistics</td>
<td></td>
<td>10/342</td>
</tr>
<tr>
<td>Adjusted determination coefficient</td>
<td>0/704</td>
<td>Significance (P value)</td>
<td></td>
<td>0/014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Durbin Watson statistics</td>
<td></td>
<td>2/067</td>
</tr>
</tbody>
</table>

Null hypothesis and alternative hypothesis for the significance of model are as follows:  
H0: there isn't any significant correlation between structural capital efficiency and intellectual capital.  
H1: there is a significant relationship between structural capital efficiency and intellectual capital.  

According to the results shown in table 5, significance level (sig) of structural capital efficiency (0/001) is less than the considered level for significance in this research (0.05), and absolute value of t-statistics (0/001) related to this variable is more than t-statistics obtained from the table with the same degree of freedom. Therefore, null hypothesis (H0) is rejected with 95% certainty, and H1 stating that there is a significant correlation between structural capital efficiency and intellectual capital, is confirmed.

The third secondary hypothesis test
There is a significant correlation between capital employed efficiency and company's intellectual capital.  
Relation 9: \( \text{VAIC}_{jt} = \beta_0 + \beta_1 \text{CEE}_{jt} + \varepsilon_{jt} \)

Table 6. the results obtained from the fitness of regression equation for the third secondary hypothesis:

<table>
<thead>
<tr>
<th>Name of variable</th>
<th>Variable coefficient</th>
<th>Amount of coefficient</th>
<th>t-statistics</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant number</td>
<td>( \beta_0 )</td>
<td>0/442</td>
<td>2/623</td>
<td>0/028</td>
</tr>
<tr>
<td>Capital employed efficiency (CEE)</td>
<td>( \beta_1 )</td>
<td>0/917</td>
<td>2/448</td>
<td>0.032</td>
</tr>
<tr>
<td>Determination coefficient</td>
<td>0/841</td>
<td>F-statistics</td>
<td></td>
<td>8/676</td>
</tr>
<tr>
<td>Adjusted determination coefficient</td>
<td>0/713</td>
<td>Significance (P-value)</td>
<td></td>
<td>0/025</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Durbin Watson statistics</td>
<td></td>
<td>1/966</td>
</tr>
</tbody>
</table>
Null and alternative hypotheses for the significance of model are as follows:

H0: there isn't any significant correlation between capital employed efficiency and intellectual capital.
H1: there is a significant correlation between capital employed efficiency and intellectual capital.

Based on table 6, the significance level of capital employed efficiency (0.032) is less than the considered significance level for this research (equal to 0.05), and absolute value of t-statistics (2.448) related to this variable is more than t-statistics obtained from the numbers used in this table with the same degree of freedom. Thus, null hypothesis is rejected with 95% certainty, and alternative hypothesis (H1) is conformed. In other words, there is a significant correlation between the capital employed efficiency and company's intellectual capital.

DISCUSSION AND CONCLUSION

At the beginning of this research, data required for calculating the components of intellectual capital including employed capital, structural capital, and human capital as independent variables and company's value as a dependant variable has been gathered from company's audited financial statements with the accompanying notes for 132 companies accepted in Tehran Stock Exchange over the years 2008-2012, then the variables applied in the research have been calculated by using Excel software. As a result, the significant correlation between intellectual capital and the value of studied companies has been analyzed using SPSS19 and Eviews6 software. The following findings are represented based on results obtained from the performed tests:

The level of company's intellectual capital significantly affects on company's value.
There is a significant correlation between human capital efficiency and intellectual capital.
There is a significant relationship between structural capital efficiency and company's intellectual capital.
There is a significant correlation between capital employed efficiency and company's intellectual capital.

Regarding the results obtained from the present research and based on the first hypothesis results stating that the level of company's intellectual capital has been directly affect on company's value, it is suggested that capital market participants, decision makers, financial analysts, and actual and potential investors of Stock Exchange must pay more and special attention to direct influence of intellectual capital on market value mentioned in this research in order to select optimal investment portfolios, when analyzing the investment plans in financial assets and notes payable; as considering these important factors results in selecting the optimal investment portfolio with minimal risk and maximal output. Moreover, it increases the clarity of decision-making environment and the obtained results.

According to the results obtained from three secondary hypotheses stating that there is a direct relationship between three components of intellectual capital including human capital efficiency, structural capital efficiency, and capital employed efficiency and the level of company's intellectual capital, managers and directors of addressed departments, especially human resources management are recommended that they must try to increase the human capital efficiency as well as the added value of companies' intellectual capital by managing the human, structural, and employed capital properly.

Practical suggestions of this research

Now, some recommendations are represented according to the results obtained from the present research in order to use the results as follows:

Regarding the first hypothesis results stating that the level of company's intellectual capital directly affects on company's value; people such as capital market participants, decision makers, financial analysts, and active and potential investors in stock exchange are suggested that they must focus on direct influence of intellectual capital on market value mentioned in this research in order to select optimal investment portfolios, when analyzing the investment plans in financial assets and notes payable; as considering these important factors results in selecting the optimal investment portfolio with minimal risk and maximal output. Moreover, it increases the clarity of decision-making environment and the obtained results.

Regarding the results obtained from the second hypothesis that there is a significant and direct correlation between human capital efficiency and intellectual capital, there is suggestion for managers and directors of addressed units, especially for companies' human resources' management that they try to raise human capital efficiency by managing the human capital in an appropriate way; consequently the added value of companies' intellectual capital will be increased.

According to the results obtained from the third hypothesis stating that there is a direct relationship between structural capital efficiency and intellectual capital, there is suggestion for managers and directors of addressed units, especially for companies' human resources' management that they try to increase structural capital efficiency by managing the structural capital in an appropriate way; consequently the added value of companies' intellectual capital will be enhanced.
According to the results obtained from the forth hypothesis stating that there is a direct relationship between capital employed efficiency and intellectual capital, the managers and directors of addressed units, especially companies’ human resources’ management are suggested to try more and more in order to increase the interest of employed capital by managing the capital employed efficiency in an appropriate way; consequently the added value of companies’ intellectual capital will be enhanced.

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