

The Relationship study of Financial Performance and Intellectual Capital of firms in the Capital Market of Malaysia

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Abstract

The objective of this study is to investigate the relationship between coefficient of value added to intellect capital and its different parts with performance assessment indices. Different classifications have been presented to measuring the intellectual capital that one of them has been presented by PULIC which is famous as Value Added Intellectual Capital (VAIC) that is comprised of three different constituents of human capital efficiency, structural capital efficiency and physical capital efficiency. In this investigation first the value of the intellectual capital of the companies listed on the basis of VAIC model, on Pahang Stock Exchange for a 7-year-time-period between 2008 to 2014 has been calculated and then the relationship between the components of intellectual capital and financial return of the companies have been assessed. Eight performance indices in 5 groups presenting market value, profitability, activity, capital return, orientation on value creation have been used for calculating the financial performance. In this research the statistical method was employed for data analysis with multiple regression and correlation coefficients. The considered sample of research included 73 corporations in regular manner for 7 years and the size of the company has been regarded as a control variable. The obtained findings show a positive significant relationship between intellectual capital and financial performance of corporations and the positive impact of company size on availability rate of intellectual capital and financial performance of a firm. Getting into view of these findings, we can suggest the administrators, managers, shareholders, investors and other stakeholders to focus their attention on the internal resources and capabilities of an economical organization and making use of this pattern for achieving a higher financial return and obtaining the actual value of companies.

Keywords: Pahang Stock Exchange, intellectual capital, financial performance, company size, multiple- regression,

Introduction

With the emergence of knowledge economy, knowledge in comparison to other factors of production such as land, capital, equipment and ... have found a higher priority. In such a way that in economy knowledge is considered as the most important factor of production and it is referred to as the most competitive advantage of organizations. Also, with the rapid advance of superior technology, especially in the field of communications, computer and Biological Engineering, from 1970s The pattern of global economic growth fundamental changes and following that, knowledge as the most important capital replace monetary and physical capitals [18]. One of the characteristics of knowledge is that it is Intangible, that is it cannot be touched and it is Imperceptible and its Valuation and measurement is so much difficult and although in past organizations with the use of Accounting methods could have been able to calculate the value and amount of their productions; however, today these accounting methods don't have the necessary efficiency for this purpose. Knowledge is considered as one of the most important components of

intangible assets, although in the past the assets of organizations were tangible; however, today the large part of these assets are intangible [29].

Tayles (2004) intangible assets which are supported by the law and are referred as intellectual property and include Royalties, copy rights, franchises, commercial brands, some of them are reflected in balance sheets; however, other intangible assets which include intellectual capital and act under the principle of Frequency Economics which means that with more usage of them their value will not be reduces, usually are not reflected in balance sheets [21]. The large gap between book value and market value of the companies, have created so much attention in companies for discovering the value of the deleted intangible assets from Financial Statements [29].

According to "Bontis" most of the countries of the world (including Malaysia's industries) are using traditional accounting methods that have been developed centuries for a physical and bodily-oriented business environment with tangible assets such as equipments and buildings, while knowledge-oriented business environment requires a model that contain new organizational intangible assets such as knowledge and human resource competency, innovation, customer relation, organizational culture, system and processes, organizational structure and ... [15]. It appears that traditional accounting reports would have had reflected partially the actual value create in companies and the created gap between the book value and the market value in so many companies have been among the shortcomings of the traditional accounting system in the calendar and reflection of the value of intellectual capital which have caused the mentioned discrepancy [21].

In this regard, intellectual capital has attracted the increasing attention of the academic scholars and organizational practitioners to itself. All the manages and brokers and investors in companies listed in Pahang Stock Exchanges taking note of the findings of this research with intellectual capital measurement can come close to the actual value of their company and with gaining knowledge about the intellectual capital rate of the companies can estimate the desired financial return in a more appropriate way.

Problem statement and research necessity

During 1980s the neoclassic assumptions and beliefs was challenged by resource-oriented attitude. According to the statements of Penrose (1950), competitive advantage cannot be achieved only with different combinations of productions and markets in a certain industry, but it primarily originates from distinction in different types of organizational resources. Since resources cannot always be transferred, mimicked or replaced; it is necessary to give serious attention to the resources inside one's organization instead of outside for identification of real and stable resources [14].

Traditional and current accounting has ignored the role and increasing importance of intellectual property right and knowledge in new age organizations and is not able to measure the actual value of their assets. In fact, financial statements have so many limitations in describing the actual value of companies. In today's knowledge-oriented societies, the return of the used intellectual capital has gained a higher importance than the return of the used financial capitals; this means that in comparison with intellectual capital, the role and importance of financial capitals in determining the stable potential of profitability has reduced significantly. Therefore; intellectual capital is the manifestation of intangible value strategies of companies and have an increasing role in the joint performance of production factors (4th factors) [21].

According to Marr et al. [24] the reason behind the attention of organizations toward intellectual capital management is:

- 1- Helping organizations to establish their strategies;
- 2- Evaluating the implementation of strategies;
- 3- Helping organization in making broad and various decisions;
- 4- Using the results of intellectual capital measurements as a baseline for service compensation;

- 5- Informing outside stakeholders of organizations about these assets; and
- 6- Measuring corporate financial performance and value.

The basis of the present research, is the lack of presence of items as intellectual capital in financial statements of companies of Concealment of these items in these statements and among other reasons for conducting this research we can mention to the large gap between market value and book value of companies that guides them to discover the factors that create this gap. In the past most of the assets of organizations were tangible; however, today a large part of these assets are intangible, therefore in the economy of today the success of organizations depends on the ability to manage these intangible assets.

Theoretical background

“Drunker” the famous management intellect says: we are entering a knowledge-oriented society in which the main economic resources, are any more larger capital, natural resources and workforce The main economic resource is knowledge; 21st century is the knowledge economy century. Prior to knowledge economy, industrial economy was dominant in which production factors of economic wealth have been a series of physical and tangible assets such as land, workforce, money, equipment and ... and from combining these economic factors wealth is produced. In this economy, using knowledge as a factor of production has a small role, but in knowledge-based economy, knowledge or intellectual capital as a factor of wealth production comparing to other tangible physical assets finds a higher priority. In this economy, intellectual assets, especially human capital is among the most important organizational assets and potential success of organizations is rooted in their intellectual capabilities rather than in tangible assets [13].

During the last decade, businesses have perceived the importance of the management of their intangible assets and have considered the development of brands, shareholders relations, fame and organizational culture as the most important sources of sustainable commercial advantage. In this economy the ability to create and make use of the value of intangible assets will create a core competence for organizations [21]. Kendrick, who is one of the most famous American economists, suggests that in 1925 the ratio of intangible commercial capital to tangible commercial capitals have been 30 to 70; however, the same ratio in 1990 has increases to 63 to 37. “Leo” also, indicates that companies only consist around 10 to 15 % of total market value which nothing has been done about it so far. Also, a series of studies conducted in 1999 regarding the combination of assets of thousands of non-financial companies during the time span of 1978 – 1998 indicate that the ratio between intangible to tangible assets has been 20 to 80 and in 1998 this ratio has approximately reached to 80 to 20. This considerable change has caused the development of some methods for wealth calculations in companies that the most important assets of tem is intangible assets, especially intellectual and knowledge [29].

Intellectual capital

Different definitions have been presented from intellectual capital in different sources and all that different authors have agreed upon is that intellectual capital is a form of knowledge which creates competitive advantage and presents the intangible value of an organization. however, still they haven't reach to a Consensus over a one definition; however, there is no clear combination between theoretical aspect and practical application of intellectual capital and one of the key difference between different definitions and different models measuring intellectual capital can be related to the priority that each of them allocate to the measurement of local and foreign human and social capitals. Some of these models tend to emphasize on customer capital, while some other emphasize on human capital within an organization and some other have a Holistic approach regarding the existing models measuring knowledge assets together with a comparative perspective of them. For example, according to “Bontis” intellectual capital

are the total intangible assets of an organization including knowledge, a part of human, structural, communicational, organizational, internal and forgiven capitals. In the beginning he referred to three type of humans, structural and customer capitals and in 2000 he modified his classification as human, structural, communicational capitals and intellectual property [15]. Often, experts divide intellectual capital into three groups of customer, human and structural capital.

value added intellectual capital

VAIC (value added intellectual capital) method of Pulic has been developed for obtaining information about the value of the created efficiency from tangible and intangible assets inside a company. This model is started with the ability of the company toward creating value added. Value added is the difference between IN and OUT. By OUT we mean total earnings from sales of services and products provides to markets and by IN we mean all the expenses which has been made for production of prdocuts and providing services. In this model the cost of labor (all the cost of wage, salary and its benefits) and Depreciation cost are not included in IN costs. Salaries and wages due to the active role in The process of creating value and Depreciation cost due to the fact that are among the funds that will not exit the company will not be counted in VA and IN. therefore, for calculating VA, Salaries and wages cost and Depreciation cost should be added to operational profit (Hang, 2009, p.14).

2-4- human capital: indicate to the implicit knowledge which is placed in the minds of employees. Human capital is defined in terms of combinations of competencies, attitudes and innovations of the employees. Employees' competencies in fact is the hardware part of intellectual capital which includes employees knowledge, skills and talents and by knowledge we are referring to academic and know-how knowledge and employees' skills refers to their ability in performing their practical tasks which is achieved through practice and some of them are achieved through education. Attitudes in fact refer to the software part of intellectual capital which includes motivation for work and job satisfaction. Employees' creativity enables them to put their knowledge in use and have continuous innovation [18].

3-4-structural capital: it deals with the systems and structures of an institute and in fact is the same as the procedures and routines of a business. Structural capital can be divided into cultural, organizational structure, organizational learning, operational processes and informational systems [18].

4-4- customer capital (communicational): in "Bontis" view, customer capital refers to the knowledge places in the marketing channels of an organization, which an organization creates them through performing its businesses. In comparison to the other three capitals this capital has more direct effect on value realization of a firm and increasingly has turned into an important factor in businesses [15].

Table (1) a summary of quantitative assessment methods and components of intellectual capital (IC) (author Erik Sveiby)

Description of measurement method	Class	The main reasoning source	term	Approx . year of envelopment
A combination of four indicator: identity, human capital, knowledge capital and fame. Has been developed by "human resource counseling group" of Norway.	SC	Sandvik(2004)	Topplinjen/ Business IQ	2004
A proposition of the research plan supported by the government regarding how Danish institutions should report their intangible assets. Intellectual capital refers to: 1) knowledge description, 2) total ability of the management, 3) number of innovatins, 4) relevant indicators	SC	Mouritzen ,Bukh & al. (2003)	Danish Guidelines	2003
Development of the directing framework of Skandia and combining it with monitoring thinking of intangible assets: efficiency rate, Renewal and risk	SC	Edvinsson (2002)	IC Rating	2002
A matrix of non-financial indicators has been organized in three classes as per the development cycle: discovery (learning), implementation (performing), commercial transformation (commercialization)	SC	Lev B.(2002)	Value Chain Scoreboard	2002
From a research design supported by EU a framework has been resulted for the management and disclosing intangible assets. 1) Defining strategic goals, 2) defining intangible resources, 3) actions taken toward development of intangible resources. Three categories of intangible assets: human capital, structural capital and communicational capital.	SC	Meritum Guidelines (2002)	Meritum guidelines	2002
A method for identification of six practical aspects of the capabilities of an organization developed in four steps: 1) define key knowledge assets, 2) specify key knowldeg processes, 3) planning of actions based on knowledge procees, 4) improvement of implimentatioln and supervision tools and then move to the first step	SC	Marr & Schiuma (2001)	Knowledge Audit Cycle	2001
Accounting methodology with the use of KMPG for accounting and allocating value for 5 types of intangible assets was proposed: 1) Property and Endowment, 2) skills and implicit knowledge, 3) collective values and norms, 4) technology and explicit knowledge, 5) management and main proceses.	DTC	Andriessen & Tiessen (2000)	The value ExplorerTM	2000

A methodology for determining the value of intellectual assets	DTC	Sullivan (2000)	Intellectual asset valuation	2000
A design and method developed by a Canadian institute. TVC has applied liquidity in descending planned form to test the effect of events on activities of a program.	DTC	Anderson & Mcleen (2000)	Total Value Creation, TVC TM	2000
Measures the rate and quality of the applied intellectual capital efficiency in creating value based on three following major variables: 1) used physical capital, 2) human capital, 3) structural capital	ROA	Pulic (1997)	Value Added Intellectual Coefficient (VAIC TM)	2000
Earnings of knowledge capital have been estimated as a part of the total normal earnings and more than the documented earnings of book assets are expected.	ROA	Lev (1999)	Knowledge Capital Earnings	1999
Hierarchy uses weighted indices combined and preferably have been focused on relative values rather than absolute ones. Combined value added= monetary value added + value added of the intangible assets	DTC	McPherson (1998)	Inclusive valuation Methodology (IVM)	1998
It is A descending planned system and is The difference between AFTF value in the end and beginning of the period and the value added during the period.	DTC	ash H (1998)	Accounting for the future (AFTF)	1998
Interpretation of the net value of a firm over market value of its share and dividing it to the tangible capital {perceived IC + IC analysis +SCA (considerable competitive advantage)}	MCM	Standfield (1998)	Investor assigned market value (IAMV TM)	1998
It is calculated with adjusting the announced profit of the company with the related costs of intangible assets. Changes in preparation of economic value added (EVA) is a sign of intellectual capital of the firm, which can be either production or non-production.	ROA	Stewart (1997)	Economic Value Added (EVA TM)	1997
Calculates extra returns on fixed assets, then uses it as a ratio of the relevant return to intangible assets.	ROA	Stewart (1997) Luthy(1998)	Calculated Intangible Value	1997
Integration of all the individual indicators (indices) presenting the intellectual characteristics and components in a single index. This is changes in this index that lead to changes in market value of the firm.	SC	Roos Dragonetti And Edvinsson (1997)	Ic-Index TM	1997
Intellectual capital has been measured with analyzing more than 164 standard criteria (91 intellectual baselines and 73 commercial standards) which covers 5 elements: 1) financial, 2) customer, 3) procedural, 4) development and renewal, 5) human element	DIC	Edvinsson And Malone (1997)	Skandia Navigator	1996
The indicators' rate have been selected based on the firm's strategic goals to measure four aspect of creativity value of three classes of specified	SC	Sveiby (1997)	Intangible Asset Monitor	1994

<p>intangible assets. (individuals' competencies, internal structure, external structure). Aspects of creating value: 1) growth, 2) renewal, 3) productivity/ efficiency, 4) reducing risk/ stability</p>				
<p>A firm's performance is measured by indexes covering the four following main aspects: 1) financial aspect, 2) customer aspect, 3) learning aspect. Indexes are bases on a firm's strategic goals.</p>	SC	Kaplan and Norton(1992)	Balanced Score Card	1992
<p>The difference between market value of the share of a firm and book value of that firm will be describe in the following way with the use of three related families of capitals: human capitals, organizational capital and customer capital. This classification was first published in the following book in a standard way.</p>	MCM	Sveiby (1989)	Theinvisible Balance Sheet	1989
<p>"q" is the market value of the share of a firm divided on the replacement cost of its assets. Changes in "q" is a measure for measuring the effieicny or non-efficiency of the perofmrance of intellectual capital of a firm which has been developed by two economists (laureate N & Tobin J) in 1956.</p>	MCM	Tobin J.	Tobins q	1950

Analytical model and the method of measurement of research variables:

For explaining the relationship between corporate financial performance and the employed intellectual capital, the following multiple regression model has been used:

$$Y = \beta_0 + \beta_1 HCE + \beta_2 SCE + \beta_3 CEE + \beta_4 FSIZE + e_i$$

A) Independent variable: intellectual capital

Pulic in 1998 and 2000 presented Value Added Intellectual Capital (VAIC) for measurement of intellectual capital of firms. In the presented model by Pulic intellectual capital is divided into three components of human, cultural (organizational) and physical capitals. In the present research Pulic model has been use for calculation and measurement of intellectual capital and that reason for using this method is the ease of its application in calculation of intellectual capital and its independence and its realness which uses financial statements and their complementary notes and as we know financial statements show what exist in reality and they are not imaginary and they look at what exist in a firm through a monetary (Rial) view.

$$VAIC = HCE + SCE + CEE \quad VAIC = \text{intellectual capital value added}$$

HCE = Human capital efficiency

SCE = Structural capital efficiency

CEE = Physical capital efficiency

This model starts with the ability of the firm with creating value added. Value added is the difference between IN and OUT. Therefore, Value added can be calculate through the following equation:

$$VA = OP + EC + D + A$$

OP = Operational profit

A + D = Depreciation and Amortization of tangible and intangible assets

EC = Total Employee Expenses

In the present research the total employee expenses (EC) has been extracted from statements and Cost Notes (Direct wage and manufacturing overhead), Administrative expenses and cost of sales. Also, Depreciation and Amortization of tangible and intangible assets have been extracted from the table of Adjusted operating cash flow.

Physical capital efficiency (CEE): refers to the ratio of value added (VA) to the employed physical capital, the index of which can be obtained through the following relationship:

$$CEE = VA / CE = \text{Value Added} / \text{Tangible asset}$$

$$CE = \text{Total assets} - \text{intangible assets} = \text{tangible assets}$$

Human capital efficiency (HCE): human capital efficiency factor indicate that how much value added (VA) for each spent Rial for employee expenses (wage and salary) in firm has been created. Ratio of VA to HC, will indicate the capability of human capital (HC) over value creation in a firm.

$$HCE = VA / HC = (\text{value added}) / (\text{total employee expenses of salary and benefits of a firm})$$

$$HC = \text{total paid salary and wage to human resources} = \text{total expenses of the employees of a firm}$$

Structural capital efficiency (SCE): the third relationship is “structural capital efficiency” (SCE) which indicates to the contribution of the structural capital in creation of value added. Structural capital include all the non-human Knowledge repositories in an organization which includes databases, organizational charts, processes and solutions and grants a value beyond physical assets to an organization. In the Pulic model, structural capital (SC) is equal to VA minus HC. In this way the third relationship between VA and SC will be calculated in the following way:

$$SCE = SC / VA = (\text{Structural capital}) / (\text{value added})$$

$$SC = VA - HU = (\text{Value added}) - (\text{total employee salary expenses of a firm})$$

B) Dependent variable: financial performance indices

For calculating corporate financial performance in the present research 8 financial indicators in five groups as the representing measures for corporate financial performance have been selected which are:

C) Control variable: firm size

Firm size: firm size is influential on the relationship between intellectual capital and corporate financial return and performance. In the present research the effect of the size of the firm on the relationship between these variables with its effect on the regression equation has been controlled. For calculating the size of firm natural log of market value of a firm has been use.

$$\text{Log} = M. V$$

$$M. V = \text{Market value of a firm}$$

Research methodology

The present research is an applied research from aim point of view and from method viewpoint is a correlation research. The aim of a correlation study might be to establish the relationship or to prove the lack of its existence and to apply relationship in conducting predictions [5]. In this study bibliographical method has been used for data collection for literature part of the research and the data collection tools are data banks and the required data include operational profit, employees salary and wage expenses, Depreciation and Amortization, tangible assets, total assets, equity, income, stock price of the sample firms stated in their audited financial statements and these data have been extracted from the available records in RahAvardNovin Software as well as in some case from electronic archive and internet and due to using audited financial statements it can be said that the used data in this study are real data and have high validity and reliability. Research statistical population includes all the listed companies on Pahang Stock Exchange. The reason of choosing these firms as our research population is ease of access to their audited

financial statements as well as accesses the stock returns of these firms during different dates. Considering the 7 year time period of the present study (from the beginning of 2006 to the end of 2012), those firms have been selected that at least have been listed on Pahang Stock Exchange at the beginning of 2006 and also their fiscal year would end at 20th March of every year. A systematic elimination and stage wise sampling method has been used.

In the present study, the firms selected as sample should have all the following conditions:

1. Should have been listed on Pahang Stock Exchange at least before 2001.
2. Their fiscal year should end at 20th March of every year.
3. The stock of these firms should be traded in the beginning and at the end of their fiscal year.
4. Should have submitted their Year-end financial statements for review to Exchange.
5. During the period under review, the firm should not have operational loss in its Fiscal year end audited profit and loss account and also its financial balance after tax of Profit and loss account will be negative amount.

Considering the above mentioned, from all the listed firms in Pahang Stock Exchange, a number of 282 firms has their fiscal year ended in 20th March of every year. From these 282 firms, 137 firms have trading interruptions which are deleted from research population and another 72 firms also are deleted who doesn't meet the conditions in articles 4 and 5 and finally 73 firms are selected as our sample for this study.

6- Research hypotheses

The hypotheses of the present study include 6 main hypotheses and 5 secondary hypotheses which are presented as below:

1st main hypothesis: there is a significant relationship between intellectual capital variables and market valuation indicators as the corporate financial performance index.

1st secondary hypothesis: there is a relationship between variables of intellectual capital and the ratio of market capitalization to book value of common stocks (MB) of a firm from market valuation indicators.

2nd secondary hypothesis: there is a relationship between intellectual capital variables and ratio of Tobin q of a firm from market valuation indicators.

3rd secondary hypothesis: there is a relationship between intellectual capital and ratio of P/E variables from market valuation indicators.

2nd main hypothesis: there is a significant relationship between intellectual capital and profitability ratio (ROA) variables as an indicator of corporate financial performance.

3rd main hypothesis: there is a significant relationship between intellectual capital and activity ratios (ATO) variables as an indicator of corporate financial performance.

4th main hypothesis: there is a significant relationship between intellectual capital and capital return variables as an indicator of corporate financial performance.

4th secondary hypothesis: there is a relationship between intellectual capital variable and ROE index which is one of the criterion of capital return.

5th secondary hypothesis: there is a relationship between intellectual capital variable and ASR index which is one of the criteria of capital return.

5th main hypothesis: there is a significant relationship between variable of intellectual capital and index of creation value emphasis as a new criterion of corporate financial performance.

6th main performance: there is a significant relationship between firm size with total average of intellectual capital and corporate performance.

7- Data analysis method

After completing data collection step, the research has a huge collection of data at hand which should use them for performing the next step; that is should extract and classify the available data and prepare them for the fundamental step of data analysis [4].

In line with this aim, first intellectual capital index as independent variable has been calculated through the extracted data from the financial statements and available data in data banks for the sample firms for the 7 year period. Then for calculation of the indices of the corporate financial performance through the available data in data banks and for calculating EVA from the extracted data the text of the financial statements have been used. Following that, after performing normality test, the dependent variable has been studied. For models analysis on a year to year basis Pearson's correlation coefficient has been used and for integrated data regression analysis has been use. The basis of inference has been from significance level of P-value, in such a way that when the value of probability or significance level of the test will be smaller than 0.05, null hypothesis will be rejected at the confidence level of 95%. Using SPSS software for testing hypotheses and performing other analyses with the application of statistical methods of normality test (Kolmogorov-Smirnov test), Autocorrelation test (Durbin-Watson), Multi colinearity, Variance inflation factor, correlation (correlation coefficient, determining factor), regression analysis and test of its coefficients, correlation analysis and its coefficients and test of significance equality of a few correlation have been used. Validity of the estimated models over the validity of the required assumption for the model estimation in the present research has been studied in the following ways:

- 1) Kolmogorov - Smirnov test
- 2) The remaining diagram against the estimated values (not having the pattern / model in this diagram indicate to the Homogeneity of variance. this diagrams have been presented in the analysis of every hypothesis)
- 3) Durbin-Watson test (values near to 2 indicate lack of autocorrelation)
- 4) Value of Variance inflation factor (factor of increasing variance) in the end of the estimated tables values smaller than 5 indicate to lack of severe colinearity among independent variables.

Four variables from 8 dependent variables have shown normal distribution in different year which are: EVA, ASR, ATO, ROE and the other Four with Log transformation will find a normal distribution. These variables have been used in these forms in the models: Ln(ROA), Ln(P/E), Ln(Q-TOBIN), Ln(MB).

Descriptive indicators of variables

Normally for a better identification of research population and in order to getting familiar with the research variables, data will be described before statistical data analysis. Also, descriptive statistical data analysis is used in line for identifying a dominant pattern on the data and a basis for explaining the relationship between the variables in the research. Therefore, in the beginning of this chapter the research variables will be describes and will be studied briefly in table (1-4). This table includes some indicators for describing the research variables. These indicators include central indices such as average, mean, standard deviation, skewness, kurtosis. Calculation of these indices in general and also in separation by year has been calculated and presented in the following tables.

The average value of the data indicates that 50% of the data are less that the middle number of the series and 50% of the data of more than the middle number of the series. The closeness of the average and mean indicate to the symmetry of data. Standard deviation shows dispersion and finally skewness is the symmetry index of the data. In the following table data analysis for each year and for different variables has been presented separately.

Considering the above table, the characteristics of the research variables have been specified somehow and all the variables can be analyzed considering the relevant indicators in statistical view. As table (2-4) shows that the number of data for all the variables are 511 for total 7 years under study and the second row shows the average of the data. For example, the average of intellectual capital and economic value added are equal

to 11.55364 and 50.4983.48. the 4th row shows dispersion and deviation parameters from average criterion and the 5th and 6th show skewness and kurtosis over normal curve (bell-shaped) that the variable of economic value added with 7.157 has the highest skewness among variables.

Research hypotheses test

1st main hypothesis: there is a significant relationship between intellectual capital variable and market valuation indicators as an index of corporate financial performance.

Secondary hypotheses will be tested with the following statistical symbols:

$$\left\{ \begin{array}{l} H_0 : \beta_1 = \beta_2 = \beta_3 = 0 \\ H_1 : \beta_i \neq 0 \text{ at least } i = 1,2,3 \end{array} \right.$$

Considering the fact that the significance level of correlation coefficient for 1st and 2nd secondary hypotheses are smaller than 0.5 and the regression model is also significant, it can be concluded that intellectual capital can explain the changed over MB and TOBIN Q in an acceptable level (respectively 32% and 47%). Also, considering the results of the 1st to 3rd secondary hypotheses which led to the confirmation of 1st and 2nd secondary hypotheses and rejection of 3rd secondary hypothesis and also the obtained information from table (3) we can conclude that Ho is rejected and H1 is accepted and this indicate that the 1st main hypothesis of the research is confirmed, that is we can conclude that there is a positive relationship between intellectual capital and market valuation indicators especially the components of physical and structural capitals.

From the result of the 1st main hypothesis it can be claimed that the finding of this research is consistent with the findings of Chen et al [18], Wang [21], Chan, Anwari [3], Madhoushi [6] and has some similarities and some differences with other studies in the same field.

1st main hypothesis: there is a significant relationship between intellectual capital and profitability ratio (ROA) variables as a corporate financial performance.

The above hypothesis will be tested with the following statistical symbols:

$$\left\{ \begin{array}{l} H_0 : r_{ROA,VAIC} = 0 \\ H_1 : r_{ROA,VAIC} \neq 0 \end{array} \right. \quad r_{ROA,VAIC}$$

= correlation coefficient between intellectual capital with profitability ratio (ROA) variables

Considering the conducted studied in the time span of 2006 to 2012 and the findings in table (4) indicate that correlation coefficient in the explained model between the variables of intellectual capital and ratio of ROA is equal to 0.318. considering the confidences of F and T and significance value of them there is a significant and positive but weak relationship between them and intellectual capital can explain 10% of the changes of Return on assets ratio (ROA) including market valuation indicators of a firm. Also considering the fact that the coefficients of physical capital efficiency and structural capital efficiency have the highest value (2.19 and 1.82) in the regression equation; hence, has a higher power of explaining comparing to the variable of human capital and human capital doesn't have a significant effect on ROA index.

Namazi and Ebrahimi in their study have confirmed the existence of a positive relationship between intellectual capital with Return on Assets Ratio with a determining factor of 0.697 and have found similar results [11].

3rd main hypothesis: there is a significant relationship between variables of intellectual capital and ratios of activities as indices of corporate financial performance.

The above hypothesis is tested with the following statistical symbols:

$$\left\{ \begin{array}{l} H_0 : r_{ATO,VAIC} = 0 \\ H_1 : r_{ATO,VAIC} \neq 0 \end{array} \right. \text{correlation coefficient between variables of intellectual capital and ratio (ATO)}$$

As table (5) shows the significance level of the correlation confidence between variables of intellectual capital and asset turnover (ATO) – activity ratio is larger than 0.5 which is acceptable. This together with the fact that regression model is not significant for variables of human and structural capitals indicate that Ho is accepted and H1 is rejected. That means that it can be concluded that there is no significant relationship between intellectual capital and activity ratio (ATO). Determining factor or R² is equal to 0.135 which indicates to lack of balance in explanation of changes of assets turnover ratio ATO by intellectual capital variables.

4th main hypothesis: there is a significant relationship between variables of intellectual capital and ratios of capital return as an index of corporate financial performance.

Secondary hypotheses with the following statistical symbols will be testes:

$$\left\{ \begin{array}{l} H_0 : \beta_1 = \beta_2 = \beta_3 = 0 \\ H_1 : \beta_i \neq 0 \text{ at least } i = 1,2,3 \end{array} \right.$$

Considering the findings from table (6) we can see that correlation coefficient in the explained model between the variables of intellectual capital and Book ratio return on equity is equal to 0.889. Considering the F and T coefficients and significant value, there is a positive and significant relationship between physical and structural capital and ROE and intellectual capital can explain 79% of the changes of Book ratio return on equity (ROE) including Return on capital indices. Also, considering the fact that the coefficients of physical capital and structural capital efficiency have the highest value (0.534 and 0.353) in this regression equation; hence, they have a higher explaining power comparing to human capital which has a reverse relationship. Hence, considering the results of the 4th and 5th secondary hypotheses which lead to confirming the 4th secondary hypothesis and rejection of 5th secondary hypothesis and also the information obtained from the above table it can be concluded that Ho hypothesis is rejected and H1 is accepted and this indicates that 1st main hypothesis is confirm. That is it can be concluded that there is a positive relationship between intellectual capital and return on capital indices.

From the comparison of the result of 4th main hypothesis with other studies it can be stated that the findings of this study is consistent with the findings of Namazi and Ebrahimi [11], Madhoushi and Asgharnezhad [6], Goldi Sedghi [7], Chen et al. [18], Wang and Appuhami [13] and has some similarities and some difference with other studies in the same field of study.

5th main hypothesis: there is a significant relationship between the variable of intellectual capital and value creation-based index EVA as the new index of corporate financial performance.

The above hypothesis will be tested with the following statistical symbols:

$$\left\{ \begin{array}{l} H_0 : r_{ASR,VAIC} \equiv 0 \\ H_1 : r_{ASR,VAIC} \neq 0 \end{array} \right. \text{correlation coefficient between the variables of intellectual capital and return on equity EVA}$$

significance value of the variables of intellectual capital and economic value added are smaller than 5%. This information indicates to rejection of H_0 and acceptance of H_1 . Correlation coefficient in the explained models between variables of intellectual capital and economic value added are respectively equal to 0.557 and 0.543. Considering F and T factors and their significant values there is a significant and negative relationship between them and intellectual capital explains 31% of the changes in economic added value. Also human capital efficiency alone has a significant and positive effect on economic value added.

Roodposhti and Hemmati in their study with the use of 6 models for measuring intellectual capital have evaluated the relationship between intellectual capital and economic value added and eventually due to the difference between the results of these models haven't reached to a consistent finding. Also, Nikomaram and Yari in their study have stated that there is a significant relationship between intellectual capital and return on investments and value added and the effect of intellectual capital on these indices. In general, although, different findings have been found from these studies what is notable is the effect of intellectual capital on economic value added index.

6th main hypothesis: there is a significant relationship between firm size with total average of intellectual capital and corporate financial performance.

Secondary hypotheses are test with the following statistical symbols:

$$\begin{cases} H_0 : \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0 \\ H_1 : \beta_i \neq 0 \quad i = 1,2,3,4 \end{cases}$$

Based on the statistical output of table (8) and ($\text{sig} \leq 5$) firm size variable has a significant relationship with corporate financial performance, except for the Asset turnover ratio index for which the relationship is negative, for the rest of the years this relationship is positive and it can be interpreted that there is a positive and significant relationship between firm size and corporate financial performance indices and intellectual capital variables in multiple regression model.

Now we want to study the effect of firm size on the relationship between intellectual capital variable and financial performance indices through studying the coefficients of the variable of firm size (FSIZE). As it has been mentioned in table (9), except for regression model of return on equity, the rest of the considered models are significant with the variable of firm size. The significant value of t-test also confirms this. Therefore, the variable of firm size is effective in explaining the relationship between the variables of intellectual capital and financial performance. studying the intellectual capital coefficients in the above equations indicates to the positive effect and consistent effect with the access rate of companies to intellectual capital and their financial performance level.

The overall conclusion

After testing each of the hypotheses and concluding each of them separately this is time for making an overall conclusion for our study. That author in the present research has reached this conclusion that there is positive and significant relationship between the components of the variable of intellectual capital and indices of financial performance at the confidence level presented in the study. In this relationship intellectual capital variable has the highest correlation and relationship with indices based on investment return, market value and value added including financial performance indices. In this regard, the effect of firm size on intellectual capital variable and financial performance is direct and in the same direction. It should be noted that in developing countries contrary to developed countries, valuation of local markets with the increase of physical capital has developed more than intellectual capital and they are less dependent on IC as a functional strategy. One of the reasons for this is that this group is still dependent on trading and processing

natural resources as a basic strategy for growth and development. Malaysia's Exchange Market also is not an exception from this and due to this physical capital (CEE) has allocated the highest coefficient in intellectual capital components to itself.

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