

The Impact of Value Added Intellectual Coefficient Components on Financial Health

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Abstract

The success of any sector in the financial market depends on how administrators can manage their companies? And this case reflected on the success in the market, which is characterized by intense competition and this also depends on the creativity and the technology used, which includes knowledge, experience and skills. This study therefore tries to investigate the impact of value added intellectual coefficient components on financial health in Jordanian industrial sector listed in Amman Stock Exchange. The results were based on the data taken from 11 industrial sectors from 2005- 2011.

The results indicates a statistically significant impact of human, employed element and intellectual capital as whole and financial health as productivity and profitability dependent variables at a strong level 1% but statistically significant structural capital with the dependent variable is liquidity at a strong level 1%. The researcher recommends attention to the assets of knowledge and encourages the efforts of human development, training and motivating them while giving flexibility to employees for the purposes of creativity and innovation.

Keywords: *intellectual capital; financial health, productivity; profitability, liquidity, debt.*

JEL classification: G14, M41.

Introduction

The intellectual capital wealth of the company which includes individuals qualified and trained in the preparation of a group of employees in a manner eligible reflected on all departments company allowing them to innovation and development in a non-traditional and non-equal and this is known as capital intellectual. The intellectual capital concept is still the subject under discussion from researchers with the ongoing work on the development of models for measuring, attempts have been made various by companies and countries to develop intellectual capital to reflect the value of the company's non-traditional by traditional accounting on the other hand, it is not clear whether certain types of companies are more likely to focus on the management of intellectual capital, as the interest that reflects the concept of quality in institutions where success depends on the practical knowledge of all aspects of the company and with the availability of full awareness that management. Where facing contemporary organizations today, a big challenge, especially that it is working in an environment that is stable

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and complex where she works constantly to solve debt problems through investment in order to increase their efficiency and enhance their competitiveness to ensure their survival and growth and thus has to be to achieve balance between the physical assets. Riahi-Belkaoui, (2003).

Hence, intellectual capital consists of (1) tacit knowledge and innovativeness of the employees, (2) infrastructure of human capital and improvement processes of structural capital and; (3) external relationships of the firm (i.e. customers' capital). Bontis et al., (2000;) Riahi-Belkaoui, (2003).

These are the key drivers of organization performance and creation of future wealth .It also works to achieve the objectives of financial sector advanced and sophisticated and has a dynamic is also working on a desire to shift to a knowledge-based economy, it must have to work to direct more efforts to build human intellectual capital (Lepak and Snell,1999).

Through industrial development, the institutions based on physical assets and natural resources as a source of wealth where the land, buildings and real estate of great importance and is considered the act as the company's assets, however, in the knowledge-based economy, also known as the new economy, emerged force of globalization, which are strongly those communication and knowledge has become the most important resources for the organization, Where the revolution called for the transition to globalization, computing and information technology to the recognition of intellectual capital Brennan and Connel (2000) it was noted that the existing assets in the financial reports of the company is responsible for a large proportion of the contradiction between the book value of the market. The concept of intellectual capital to the market-to-value ratio of the Standard & Poor's 500 companies is in excess of 6.0, compared to just over 1.0 in the early 1980s (Lev, 2001). In the while that some of this difference attributable to the current value of the assets physical, financial and that exceed the historical cost, and is due there on to the high the importance of intangible assets by a large margin, Where these assets are created through innovation, and organizational practices, human resources, or a combination of these sources, and may be embedded in physical assets and staff (Lev, 2001)

The firms in general still developing to exploit the data many in the process of lifting the performance of the firms and so came this study aimed to test the impact of intellectual capital in all its dimensions on the financial health through liquidity and productivity, debt and profitability Therefore, this study is trying to verify the effectiveness of their intellectual capital in the Jordanian industrial sector. This study tries to analyze the impact between the dimensions of intellectual capital, and financial health.

1. Theoretical Framework

1.1 Definition of Intellectual Capital

The results showed the experimental growing importance of intellectual capital of the company it enhances the value of the company's competitiveness in the market showed further research be attributed, on average, in 1995 more than 75% of the value of companies from the health care industry and personal services to the intellectual capital of the company Luthy, (1998) . Intellectual capital is a prominent supplier to create economic wealth. Still tangible assets such as real estate, machinery and equipment are important factors in the production of both goods and services, however, have dropped relative importance through time and became there the importance of intangible assets and asset-based knowledge and increased the concept of the importance of intellectual capital, which is synonymous with the intangible assets of the company Stewart, (1997). Intellectual capital is defined more comprehensively as combined intangible assets, which enables the company to do various functions and in general can explain the concept of intellectual capital through the following concepts Brooking, (1996):

- Knowledge which may be implicit or explicit information.
- Knowledge transformation processes through the concepts of research and development and organizational learning.
- Knowledge products such as patent, trademark and other.

Though a variety of definitions have utilized the concept of knowledge, Skyrme and Associates, (2000) argued that intellectual capital was not just a part of human brainpower but goes beyond that to the assets that can be identified and optimal use in organizations. Barry Brinker, (2000) defined by precise description of the analysis of the concept of knowledge management and work to benefit from the development of the survival and continuity which formed the high value of the company, which separated the human intelligence, skills and creativity.

1.2 Components of Intellectual Capital

A lot of organizations need to develop in order to stay where they must introduce the concept of intellectual capital, which gives it a competitive advantage, which prompted many of these organizations to manage the design and development of training programs distinct increase the likelihood of the emergence of strategic leaders and maintain the capacity core and investment, and development of organizational culture and ethical.(Hitl et al ,2001) . Both Stewart,(1997) and Miller,(1998) pointed for development of the following three possibilities makes it possible to build a solid base of intellectual assets, namely: (expansion intelligence, encourage innovation, and standardization of ideas and acts. The classification of intellectual capital is important institutions where consists of a group of assets and which must be integrated with each other to create the value-added terms provided building an intellectual, which is the first point in

the desired direction for many researchers, where consists intellectual capital according Edvinsson from the human and structural capital (Edvinsson and Malone, 1997).

A lot of researchers such as Brinker (1997) and Skyrme and Associates (2000b) discussed dimensions or categories of the concept of intellectual capital, where these groups were increased by adding after customers' capital. Brooking (1996) suggested that intellectual capital was a function of four element asset types: (1) market assets, (2) intellectual property assets, (3) human-centered assets, and (4) infrastructure assets. Draper (1997) arguing that the major element asset types of intellectual capital are :.(1) human capital; (2) structural capital; (3) customer capital; (4) organizational capital; (5) innovation capital; and (6) process capital.

The intellectual capital defined that human capital stock of knowledge, experience and training, Also known as structural capital as a set of regulations and laws, which includes patents and computer and information technology and composition so as to achieve the best value for customers but customer capital, which reflects the extent of the service provided to him and feedback and the loyalty of the good or service provided Stewart, (1999).

1.3 Literature Review

The intellectual capital thinking was very much to the researchers and to bridge the gap between the book and market value (e.g. Lev and Zarowin, 1999; Lev, 2001) and where it was simply the definition of market value in excess of the book value of intellectual capital (Edvinsson and Malone, 1997) where he plays the intellectual capital of an important role to create value and increase knowledge and that contribute to creating a competitive advantage for the company, as the determinants of intellectual capital, human capital and capital structural, which is created from customers, processes, systems, trademarks and other Edvinsson and Malone, 1997), have been recognized as the factors that determine corporate well being Which may affect the owners of interests of managers and shareholders, lenders and competitors and others. (Bornemann 1999; Pulic 2000; Firer & Williams 2003; Mavridis 2004)

Some studies that intellectual capital does not provide a value for the company and do not work on improving financial performance and that it does not reflect the value of social responsibility and some studies (Kujansivu & L.nqvist, 2005) (Shiu, 2006) (Chen, Cheng, & Hwang, 2005) pointed out that intellectual capital provides the performance of companies better financial . Many of the studies explain the intellectual capital and social responsibility that reflect the actual work of individuals leading to improve the needs of the institution in terms of social responsibility is one of the important issues and the first enterprise-level studies as interpreted by the concept of intangible assets or knowledge assets (Bontis, 2001) (Tseng & Goo, 2005).

The study of (Tsoutsoura, 2004) include that social responsibility can be seen as a comprehensive set of policies, practices and programs that are integrated into business processes, supply chain and decision-making processes throughout the company usually includes issues relating to business ethics and investment in the community, and the market, in addition to the workplace. A later study by Goh (2005), aimed at measuring intellectual capital performance from commercial banks in Malaysia during the period 2001-2003, that all banks, in general, where the efficiency of human capital higher than the structural efficiency and capital efficiency. It also suggested that are significant a difference in terms of the rankings depends on the efficient use of VAIC accounting measures and traditional accounting.

Firer and Williams (2003) shows the results include no relationship between the efficiency of the economic value-added generated by the key components to keep the intellectual capital is human capital and structural material and with the financial performance while Chen et al. (2005) study indicated there is a relationship between capital intellectual and profitability, where it enhances the value of the company as indicated study. Huang and Liu (2005) explain that capital creative associated relationship is linear with the performance and this means that there is a positive impact for investments capital creative with the performance, but the greater the investment limit optimization will impact negatively on the performance and this requires coordination between capital investments and intellectual capital elements so as to obtain a competitive advantage. The aim of this theoretical study Marr and eta, (2003) to review the importance of measuring intellectual capital, and the amount of benefits to organizations because of it, and the results indicated that most of the research in this area is still in the conceptual stage and the primary, also addressed the contributions of researchers in the development of the field of measuring intellectual capital in organizations business.

Shiu's (2006) indicated the use of a sample of 80 IT companies listed on the Taiwan market Shiu found a significant and positive relationship among financial performance and intellectual capital model. Royal and O'Donnell (2008) that human resource capital is part of intellectual capital and is a very important element of value creation. Bannany (2008), Kamath (2008) pointed to the use of value-added customer relations intellectual capital as a measure of capital, after all, customer loyalty, customer satisfaction and this reflect to corporate firm performance.

Laing, Dunn and Lucas (2010) examined the empirical relation of intellectual capital performance and financial performance of hotel industry of Australia from 2004-2007 and the results indicated that Intellectual capital efficiency is based on human capital efficiency which positively encourages financial performance.

Ahangar (2011) examined the impact of intellectual capital performance and financial returns of Iranians firms and the results are a significant and positive impact on financial returns of companies whereas the relationship of structural and physical capital was not significant with financial performance of companies.

Maditinos et al. (2011) explained the empirical relation of intellectual capital and financial performance of 96 listed firms in Athens Stock Exchange and the results show human capital efficiency has significant and positive relation with financial performance

2. The Data and Methodology

2.1 Population and Sample

This study used a quantitative method when analysis the data .The sample for the population is taken from 2005 -2011 from the Amman Stock Exchange (ASE) in Jordan for 11 industrial sector include : Chemical Industries , Mining & Extraction Industries Sector, Tobacco & Cigarettes Sector, Electrical Industries , Paper & Cartoon Industries, Engineering & Construction Industries Sector, Pharmaceutical & Medical Industries Sector, Food & Beverages Sector, Printing & Packaging Sector, Glass & Ceramic Industries Sector, Textile, Leather & Clothing.

2.2 Hypotheses

This Study used an empirical methodology to test the hypotheses and used Intellectual capital includes employed capital, human capital, and structural capital. However in this study employed as suggested by Pulic (1998) and Firer and Williams (2003). The following hypotheses' statement summarizes the statements above for this study:

Main Hypothesis: There is no statistical significant impact of Value Added Intellectual Coefficient (VAIC) Components and Financial Health (FH) and to test this hypothesis which divided to elements of intellectual capital is contributing the most to financial health activities of each industrial sector.

H0-1a: There is no statistical significant impact of capital employed efficiency (CEE) and Debt Ratio (DR).

H0-1b: There is no statistical significant impact of capital employed efficiency (CEE) and Productivity Ratio (PRR).

H0-1c: There is no statistical significant impact of capital employed efficiency (CEE) and Liquidity Ratio (LR).

H0-1d: There is no statistical significant impact of capital employed efficiency (CEE) and Profitability Ratio (PR).

H0-2a: There is no statistical significant impact of human capital efficiency (HCE) and Debt Ratio (DR).

H0-2b: There is no statistical significant impact of human capital efficiency (HCE) and Productivity Ratio (PRR).

H0-2c: There is no statistical significant impact of human capital efficiency (HCE) and Liquidity Ratio (LR).

H0-2d: There is no statistical significant impact of human capital efficiency (HCE) and Profitability Ratio (PR).

H0-3a: There is no statistical significant impact of structural capital efficiency (SCE) and Debt Ratio (DR).

H0-3b: There is no statistical significant impact of structural capital efficiency (SCE) and Productivity Ratio (PRR).

H0-3c: There is no statistical significant impact of structural capital efficiency (SCE) and Liquidity Ratio (LR).

H0-3d: There is no statistical significant impact of capital structural capital efficiency (SCE) and Profitability Ratio (PR).

H0-4a: There is no statistical significant impact of value added intellectual coefficient (VAIC) Components and Debt Ratio (DR).

H0-4b: There is no statistical significant impact of value added intellectual coefficient (VAIC) Components and Productivity Ratio (PRR).

H0-4c: There is no statistical significant impact of value added intellectual coefficient (VAIC) Components and Liquidity Ratio (LR).

H0-4d: There is no statistical significant impact of value added intellectual coefficient (VAIC) Components and Profitability Ratio (PR).

2.3 Model and Variables of Study

In order to create a proper assessment of the regression, independents variables as value added intellectual coefficient (VAIC) components. VAIC is a composite sum of three indicators of physical capital employed efficiency (CEE), human capital efficiency (HCE) and structural capital efficiency (SCE).which may have an effect on financial health as dependent variable include profitability, productivity, liquidity and debt ratios need to be introduced.

Independent Variables: Value Added Intellectual Coefficient (VAIC) Components:

1. Capital employed efficiency (CEE),
2. Human capital efficiency (HCE) and
3. Structural capital efficiency (SCE).

The procedures for computing VAIC are: first calculate Value Added, which is derived from the difference between outputs and input. Value added is expressed as:

$$VA = S - B - DP = W + I + T + D + NI$$

Where S is the net sales revenues; B is cost of goods sold; DP is depreciation; W is staff costs; I is interest expense, D is dividends; and T is taxes and NI is the net income. Then calculate physical capital employed (CE), human capital (HC) and structural capital (SC). Pulic (1998) states that CEE is:

$CE_i = \text{book value of the net assets for firm } i;$

Edvinsson and Malone (1997) and Pulic (1998) stressed that total salary and wage costs are an indicator of a firm's HC, as such,

$HC_i = \text{total investment in salary and wages for firm } i;$

To derive the value of SCE, Under Pulic's model, SC is VA minus HC.. Pulic proposes calculating SC as:

$SC_i = VA_i - HC_i;$ structural capital for firm i.

The final step is to compute physical capital employed efficiency (CEE), human capital efficiency (HCE) and structural capital efficiency (SCE). These values are derived using the formulae given below:

$CEE_i = VA_i/CE_i;$ VA capital employed coefficient for firm i

$HCE_i = VA_i/HC_i;$ VA human capital coefficient for firm i

$SCE_i = SC_i/VA_i;$ VA structural capital coefficient for firm i

$VAIC = HCE + SCE + CEE$

Dependent Variables: Financial Health includes:

1. Productivity Ratio
2. Profitability Ratio
3. Liquidity Ratio
4. Debt Ratio

The dependent variables are productivity ratio (PRR), which is calculated as Total Asset turnover (TAT), profitability ratios (PR) as the ratio of return on assets (ROA) liquidity ratio (LR), as the current ratio (CR) and debt ratio (DR)calculated as debt ratio.

$$CR_{it} = \alpha_0 + b_1 CEE_{it} + b_2 HCE_{it} + b_3 SCE_{it} + VAIC_{it} + \varepsilon_{it} \text{ ----- (1)}$$

$$TAT_{it} = \alpha_0 + \alpha_1 CEE_{it} + b_2 HCE_{it} + b_3 SCE_{it} + VAIC_{it} + \varepsilon_{it} \text{ ----- (2)}$$

$$DR_{it} = \alpha_0 + \alpha_1 CEE_{it} + b_2 HCE_{it} + b_3 SCE_{it} + VAIC_{it} + \varepsilon_{it} \text{ ----- (3)}$$

$$ROA_{it} = \alpha_0 + \alpha_1 CEE_{it} + b_2 HCE_{it} + b_3 SCE_{it} + VAIC_{it} + \varepsilon_{it} \text{ ----- (4)}$$

3. Empirical Results

Table 1 shows the results of the descriptive statistics for independent and dependent variables and presents the means, standard deviation, minimum and maximum value of the variables. In mean results, the variable of debt ratio was high ratio 35.38 while the capital employed efficiency variable was low ratio as 0.0811 and the high standard deviation is debt ratio 10.81 and low on capital employed efficiency variable 0.0836 and the same results of minimum and maximum values.

Table 1: Descriptive Statistics Table

Variable	DR	HCC	TAT	ROA	CR	SCE	CEE	VAIC
Mean	35.38	2.670	0.528	3.8778	1.815	1.00	0.0811	3.561
Standard Deviation	10.81	2.94	0.199	7.020	0.574	1.00	0.0836	2.966
Minimum	16.01	-3.66	0.12	-20.00	0.73	1.00	-0.09	-2.73
Maximum	70.00	16.54	1.01	28.78	3.39	1.00	0.41	17.95

The table No. 2 used regression testing to investigate the impact of human capital, which is part of the intellectual capital with the dependent variable as financial health, which divided at sectors of debt, productivity, liquidity and profitability. The results of the study there was no impact statistically significant for each of the human capital on debt and liquidity while I found a statistically significant impact of human capital with productivity at the significant level 1%, which is strong impact where the value $t = 4.372$ as was the correlation coefficient 0.451 while the coefficient of determination was 0.203 which is explained by amount of the dependent variable also I found a statistically significant impact of human capital and profitability also at the level of significance 1%, as $t = 11.734$ as was the correlation coefficient 0.805 while the coefficient of determination was 0.647 which may explained the presence of the impact of the strong correlation of human capital with the financial performance but the human capital important for companies have reflected positively on the productivity of industrial companies, which features a competition strong at the present time, so they need to attract human capital, which is characterized by experience and culture and good training so as to contribute to seize opportunities and avoid threats, which reflects good financial performance.

Table 2: regression analysis

	R	R ²	T	Sig	St-Error	B
HCC&DR	0.108	.011	0.925	0.358	0.422	0.390
HCC&TAT	0.451	0.203	4.372	0.000***	0.007	3.060E-02
HCC&CR	0.110	0.012	0.959	0.341	0.022	2.149E-02
HCC&ROA	0.805	0.647	11.734	0.000***	0.164	1.920

*Significant at $p < 0.10$ ** Significant at $p < 0.05$ *** Significant at $p < 0.01$

The table No. 3 used regression testing to investigate the impact of capital employed which is part of the intellectual capital with the dependent variable as financial health, which divided at sectors of debt, productivity, liquidity and profitability. The results of the study there was no impact statistically significant for each of the capital employed on debt and liquidity while I found a statistically significant impact of capital employed with productivity at the significant level 1%, which is strong impact where the value $t = 5.290$ as was the correlation coefficient 0.521 while the coefficient of determination was 0.272 which is explained by amount of the dependent variable also I found a statistically significant impact of capital employed and profitability also at the level of significance 1%, at $t = 13.121$ as was the correlation coefficient 0.835 while the coefficient of determination was 0.697. This results also showed that the processes of polarization and attention to customer did not have a significant impact on other levels of the variable of such liquidity and debt while the processes of polarization and activation if not followed by interesting ideas workers and their proposals and the introduction of advanced technology to work and brainstorming and attention to prestige social workers, the process of polarization will not be useless on the process of creativity and innovation in the industrial sector. The attention to the views of customers and their proposals must have the highest degree of attention and care by the departments of companies; because it will be reflected on increasing their satisfaction, thus enhancing the status of their loyalty.

Table 3: regression analysis

	R	R²	T	Sig	St-Error	B
CEE&DR	0.014	0.000	0.126	0.900	14.937	1.876
CEE&TAT	0.521	0.272	5.290	0.000***	0.235	1.246
CEE&CR	0.179	0.032	1.570	0.120	0.781	1.229
CEE&ROA	0.835	0.697	13.121	0.000***	5.341	70.080

*Significant at $p < 0.10$ ** Significant at $p < 0.05$ *** Significant at $p < 0.01$

The table No. 4 used regression testing to investigate the impact of structural capital which is part of the intellectual capital with the dependent variable as financial health, which divided at sectors of debt, productivity, liquidity and profitability. The results of the study there was no impact statistically significant for each of the structural capital on debt, productivity and profitability while I found a statistically significant impact of structural capital with liquidity at the significant level 1%, which is negative and strong impact where the value $t = -2.872$ as was the correlation coefficient 0.315 while the coefficient of determination was 0.099. This result is attributed to the attention of the systems and computer companies, which reflected the impact of the reverse direction on the company's liquidity.

Table 4: regression analysis

	R	R ²	T	Sig	St-Error	B
SCE&DR	0.122	0.015	1.064	0.291	3519689	3743939
SCE&TAT	.005	0.000	-0.044	0.965	65494.76	-2878.78
SCE &CR	0.315	0.099	-2.872	0.005***	178817.2	-513485
SCE &ROA	0.132	0.017	-1.151	0.253	2281536	-2626515

*Significant at p <0.10 ** Significant at p< 0.05 *** Significant at p< 0.01

The table No. 5 used regression testing to investigate the impact of intellectual capital which is include as collective of the human , employed and structural capital with the dependent variable as financial health, which divided at sectors of debt , productivity, liquidity and profitability . The results of the study there was no impact statistically significant for each of the intellectual capital on debt and liquidity while I found a statistically significant impact of intellectual capital with productivity at the significant level 1%, which is strong impact where the value t = 4.654 as was the correlation coefficient 0.473 while the coefficient of determination was 0.224 which is explained by amount of the dependent variable also I found a statistically significant impact of intellectual capital and profitability also at the level of significance 1%, at t = 11.251 as was the correlation coefficient 0.792 while the coefficient of determination was 0.628. Where the environment is the industrial sector, as mentioned previously characterized by competition strong, so they need to attract intellectual capital, which has the ability to add-on, and creativity, and improve working methods so as to contribute to seize opportunities and avoid threats and reflected positively on the financial performance.

Table 5: regression analysis

	R	R ²	T	Sig	St-Error	B
VAIC&DR	0.016	0.000	0.142	0.887	0.421	5.985E-02
VAIC&TAT	0.473	0.224	4.654	0.000***	0.007	3.188E-02
VAIC&CR	0.102	0.010	0.886	0.378	0.022	1.972E-02
VAIC&ROA	0.792	0.628	11.251	0.000***	0.167	1.875

*Significant at p <0.10 ** Significant at p< 0.05 *** Significant at p< 0.01

Conclusions

The purpose of this empirical study is to analysis the efficiency of the three groups of intellectual capital, i.e. human capital, structural capital, and capital employed and its impact of financial health which divided to debt, productivity, and profitability and liquidity ratios (dependent variables). The study was

conducted using the data from 11 industrial sector listed from Amman Stock Exchange (ASE) from the period 2005 -2011.

The results indicate there is a statistically significant impact of human and employed capital and financial health as productivity and profitability dependent variables element at a strong level 1% while I found the impact of a statistically significant structural capital with the dependent variable is liquidity at a strong level 1% while there was the impact statistically significant for the intellectual capital which combines all dimensions of the three with the dependent variables which productivity and profitability at a strong level 1%

This result is attributed to the existence of interest from the industrial sector of human and employed capital as skills and expertise, as well as attention to customers and their quality as basis of the value added of the company, which explains the corporate interest in capital intellectual. The researcher recommends attention to the assets of knowledge and encourages the efforts of human development, training and motivating them while giving flexibility to employees for the purposes of creativity and innovation with a focus on the importance of work and teamwork.

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