

IMPACT OF INTELLECTUAL CAPITAL ON PERFORMANCE OF INDIAN CORPORATE SECTOR

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Abstract: *The study attempts to examine the relationship between corporate intellectual capital and its components with return on equity and market valuation of the Indian companies. Intellectual capital is calculated through Value Added Intellectual Co-efficient (VAICTM) developed by Public. Companies from two major indices of NSE namely S&P CNX Nifty and CNX Nifty Junior are taken as sample for the study with a time period of ten years i.e. 2000-01 to 2009-10. The study concludes that intellectual capital is negatively associated with the market valuation but not with return on equity.*

Among the components of intellectual capital, only human capital is found to be associated with the market to book value of the companies. Physical capital efficiency observed as the dominating element for return on equity. Results of the study may be useful to Indian corporate sector to realize and measure the importance of corporate intellectual capital. There is a need to put more efforts from managers to actually report the information on intellectual capital so that investors can actually use it in taking decision regarding actual worth of the company.

Keywords: *Corporate Intellectual Capital, S&P CNX Nifty, CNX Nifty Junior; Market Valuation, Return on Equity.*

INTRODUCTION

Concept of corporate intellectual capital is not new to the managers, researchers and academicians but its systematic measurement and financial reporting have always been a problem to them. On the other hand, investors have realized the importance of intellectual capital with the recent growth of knowledge-intensive companies, but accounting standards are unable to meet the expectations of the investors. Measuring intangible assets are difficult because of its intangible nature. Guthrie *et al.* (2001) have tried to draw attention towards the issues related to accounting and management of intellectual capital. It is widely accepted that intellectual capital should be measured and reported properly by the companies, but there is a lack of consistency among the researchers and academicians about any single measuring model (Bontis *et al.*, 1999).

To have a transparent financial position of the company, intellectual capital needs to be reported accurately in the annual reports. But Guthrie *et al.* (2006), in their study observed that voluntary disclosure of intellectual capital was very low in and in qualitative form rather than quantitative. Abeysekera & Guthrie (2003), conducted the study to examine the reporting of intellectual capital in the developing nation and found that Sri Lankan firms have reported a large range of intellectual capital though not using the term directly.

Ricceri & Guthrie (2008), conducted a survey to assess the information about the use of intellectual capital in decision making. Results concluded that financial professional did not actually utilize the information of annual reports in making

decisions. But, they were of the view that greater disclosure of intellectual capital would increase company's share price. On the contrary, study by Garcia-Meca (2005) suggested that intellectual capital was widely reported to financial analyst and also used in their decision making process.

Intellectual capital is considered as the difference between market value and book value of the firm which has increased a number of times in the companies. Further, to minimize the difference James Tobin (1969), modified the model and book value was substituted by the replacement value of the companies in Tobin's q model. Differences can also be seen among the financial reporting system of developed and developing countries. These differences might be because of the diverse accounting standards in different countries. To have consistency in reporting system, International Accounting Standards (now International Financial Reporting Standards, IFRS) was adopted by many countries. India also decided to adopt IFRS from April 1, 2011.

The present paper proposes to study the total value added efficiency of intellectual capital and its components' association with profitability and market valuation of the two major indices i.e. CNX S&P Nifty and CNX Nifty Junior for a time period of ten years.

The paper is divided into four different sections: Section I includes the review of existing literature of the topic, Section II proposes the research methodology used in the study, Section III is for results and analysis. Section IV concludes the paper with policy implication.

REVIEW OF LITERATURE

The term intellectual capital and intangible assets have been used interchangeably by different scholars. There is not any standardized definition of corporate intellectual capital. Choong (2008) has drawn attention towards the different definitions of corporate intellectual capital given by different authors. The crux of the most definitions was that intellectual capital is non-monetary assets without physical in nature and can generate future benefits for the organization. Sanchez *et al.* (2000) divided intellectual capital into three different components namely human capital, structural capital and relational capital.

Bruggen *et al.* (2009) investigated the determinants of intellectual capital disclosure in decision making. Content analysis method was used in the study of 125 publicly listed Australian companies. The results suggested that industry type and firm size were the major determinants of intellectual capital disclosure.

Ghosh & Mondal (2009) examined the association between intellectual capital and financial performance of the Indian pharmaceuticals and software companies. Results found that intellectual capital efficiency in companies were an indicator of profitability but not of productivity and market valuation.

Sriram (2008) carried out a study to check the importance of composition of tangible and intangible assets of the firms and for that purpose sample was divided into two sub-samples, one having traditional physical assets and other having primarily intangible assets. Results have shown that although financial variables played an important role in financial health of the companies but intangible assets information has also revealed improvement in the financial health.

Kamath (2008) concluded that Indian domestic companies were better in utilizing and performing in case of intellectual capital by VAIC ranking. Among the different components of intellectual capital, human capital was found of having major impact on profitability and productivity of the companies.

Gan & Saleh (2008) carried out the research to assess the association between value added efficiency and corporate performance of technology-intensive companies in Bursa Malaysia. Findings of the study suggested that there was dependency on the physical capital efficiency of the companies. Physical capital efficiency has been significantly related with profitability and human capital efficiency with the productivity of the companies.

Kamath (2007) evaluated 98 Indian banks to analyze their value added efficiency. Results found that the best performers in case of intellectual capital efficiency were the foreign banks. Human capital efficient banks were foreign banks and Indian public sector banks were efficient in utilizing the physical capital. It was because of the investments of

funds in the large amount of human capital which may not be contributing to the efficiency of the banks.

Tan *et al.* (2007) also carried out a study and concluded that companies' intellectual capital was positively related with its current and future performances. The three financial ratios selected as the indicator of companies' performance were return on equity (ROE), earning per share (EPS) and annual stock return (ASR). Positive correlation was also found between increase in company's IC with that of company's future performances.

Wang & Chang (2005) analyzed the effects of intellectual capital elements on the performance of business in Taiwanese IT companies. Results found that all elements of intellectual capital (innovation capital, process capital and customer capital) except human capital directly affected the business performance.

Chen *et al.* (2005) examined the association between intellectual capital efficiency and company's financial performance and market valuation. Results were in support of the hypothesis that corporate intellectual capital with financial and market performance were positively related.

Bozzolan *et al.* (2003) investigated the disclosure of intellectual capital was related to external capital and factors affecting disclosure were industry and size of the organization. Villalonga (2004) observed that intangibility and sustainability of competitive advantage have inter-relationship among them. Two methods were calculated, namely Tobin's q and hedonic regression of q and it was concluded that intangible assets played a significant role in sustaining a firm's competitive advantage.

Firer & Stainbank (2003) investigated with a sample of 65 companies in South Africa and found that intellectual capital efficiency have explanatory power of productivity, profitability and market valuation. The reason for this could be less information disclosure available in the annual reports of the companies and hence value of the intellectual capital was not reflected in the market valuation of the companies.

Firer & Williams (2003) examined the association between intellectual capital and traditional measures of performance i.e. return on assets, assets turnover ratio and market to book value used as proxies for profitability, productivity and market valuation. Results of the study suggested that despite of the increasing importance of intellectual capital physical capital remained an important factor associated with the performance of the companies.

Bontis (2001) reviewed the existing intellectual capital models with their strengths and weaknesses. They were Skandia Navigator, IC-Index, Technology Broker, Intangible Assets Monitor, MVA and EVA. The study highlighted the need for more empirical research as on the corporate intellectual capital reporting to broaden the area.

A number of studies were carried out to assess the importance of intellectual capital in decision making by managers and analyst. In addition, studies have been carried out to check the value added efficiencies of the companies with the help of the Value Added Intellectual Co-efficient model.

Studies have been carried out to check the association between intellectual capital efficiency and traditional performance and market valuation of the companies by Muhammad & Ismail, 2009; Makki *et al.*, 2008 and Zhang *et al.* 2006. India is still in the nascent stage of reporting and measuring corporate intellectual capital.

Few studies have been conducted in India and most of them are sector specific. Few of them by Kamath, (2007) on Indian banks; Bower & Sulej, (2006), Kamath, (2008) and Ghose & Mondal (2009) on Indian pharmaceutical sector.

Research Gaps Identified

The above mentioned studies were carried out on specific sectors of Indian corporate but there is a research gap regarding the overall index based corporate performance of the companies. This research gap has necessitated the researcher to check the corporate intellectual capital performance in Indian corporate sector specially with regard to return on equity and market valuation.

RESEARCH OBJECTIVES AND METHODOLOGY

Objectives of the Study

The main objective of the present study is to investigate the relationship of value added efficiency with market valuation and profitability of the companies. Further to study relationship of components of VAIC i.e. physical capital,

human capital and structural capital with market valuation and profitability for a time period of ten years.

Hypothesis of The Study

The following hypotheses are developed for achieving the above mentioned objectives.

H₀₁: There is no association between VAICTM and market to book value of the Indian companies.

H₀₂: There is no association between VAICTM and return on equity of the Indian companies.

H₀₃: There is no association between components of VAICTM (i.e. CEE, HCE and SCE) and market to book value of the Indian companies.

H₀₄: There is no association between components of VAICTM (i.e. CEE, HCE and SCE) and return on equity of the Indian companies.

Data and Sample Selection

Two indices of National Stock Exchange (NSE) i.e. S&P CNX Nifty and CNX Nifty Junior are taken as sample and data is obtained from Centre for Monitoring Indian Economy (CMIE) database called Prowess. A time period of ten years is taken from 2000-01 to 2009-10.

As all the hundred companies are not listed for the last ten years, so the data is minimized in the previous years. Those companies whose key variables for the calculation of VAIC are missing are excluded from the study. To have consistency in the results outliers are also removed. So the final sample consists of the ninety-four companies in the year 2009-10. The above hypothesis is explained through a diagram as follows

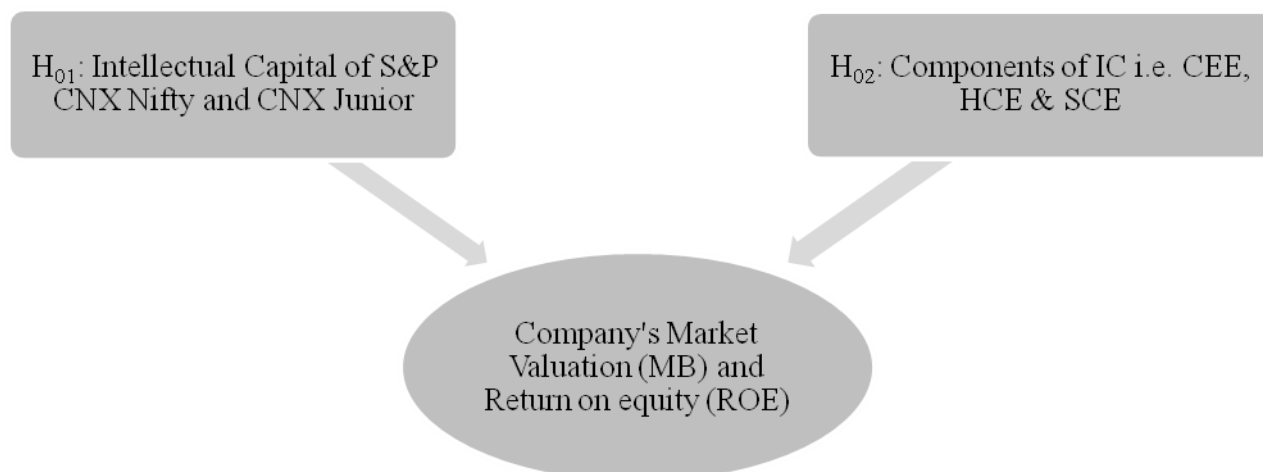


Figure 1.1 Proposed hypotheses

Figure 1.1 Diagrammatic represents of the proposed hypothesis

Variables Used in The Study

Following are the variables which have been used in the study.

Value Added Intellectual Co-efficient (VAIC™)

Prof. Ante Pulic (1998, 2000) developed the model for measuring intellectual capital efficiency of the companies. It is the value added efficiency of the intangible assets. Value added is the difference of output and input of the companies.

$$\text{Value Added} = \text{Output} - \text{Input}$$

Output consists of all the revenue and input includes all the expenses incurred in earning the revenues except the expenditure on manpower. It is argued that an expense on manpower is considered as investment rather than expense.

Pulic has divided VAIC into three major divisions. They are capital employed efficiency (CEE), human capital efficiency (HCE) and structural capital efficiency (SCE). The model

measure how much efficiency is created by the rupee spends on three components of intellectual capital.

VAIC is the sum of the above three co-efficient.

$$\text{VAIC} = \text{CEE} + \text{HCE} + \text{SCE}$$

Value Added of the companies is measured by the summation of the following items.

$$\text{VA} = \text{I} + \text{DP} + \text{D} + \text{T} + \text{M} + \text{R} + \text{WS}$$

Where, I stand for interest expenses, DP for depreciation expenses, D represents dividend paid, T is for taxes paid, M is for equity of minority shareholders in net income of the subsidiaries, R represents profits retained of the company and WS for wages and salaries of the employees.

The present study calculates value added as follows

$$\text{VA} = \text{W} + \text{I} + \text{T} + \text{NI}$$

Where,

W = wages of the employees, I = Interest, T = Taxes and NI = Profits after taxes

Further,

$$\text{CEE} = \text{VA} / \text{CE}$$

$$\text{HCE} = \text{VA} / \text{HC}$$

Table 1.1. Descriptive statistics for selected variables

Year		CEE	HCE	SCE	VAIC	MB	ROE
2010	Mean	0.544	9.133	0.801	10.478	4.383	0.308
	Std Deviation	0.408	9.035	0.149	9.119	6.850	0.374
2009	Mean	0.592	14.209	0.805	15.606	3.234	0.285
	Std Deviation	0.452	27.052	0.166	27.132	3.778	0.303
2008	Mean	0.611	13.325	0.814	14.750	5.110	0.338
	Std Deviation	0.424	18.129	0.166	18.218	4.986	0.326
2007	Mean	0.624	13.171	0.793	14.587	4.626	0.331
	Std Deviation	0.344	26.267	0.176	26.342	3.814	0.346
2006	Mean	0.584	10.460	0.774	11.818	4.136	0.298
	Std Deviation	0.343	15.375	0.162	15.468	3.246	0.256
2005	Mean	0.617	7.140	0.759	8.516	3.449	0.331
	Std Deviation	0.374	6.484	0.158	6.582	2.960	0.328
2004	Mean	0.705	6.134	0.740	7.578	2.926	0.343
	Std Deviation	0.461	5.185	0.156	5.397	2.722	0.476
2003	Mean	0.710	6.604	0.743	8.057	2.076	0.295
	Std Deviation	0.565	6.033	0.157	6.250	2.347	0.372
2002	Mean	0.678	6.960	0.735	8.373	2.303	0.231
	Std Deviation	0.619	7.272	0.172	7.538	3.207	0.270
2001	Mean	0.705	8.166	0.748	9.619	3.660	0.266
	Std Deviation	0.660	8.960	0.182	9.254	6.600	0.333

Table 1.2 Pearson Correlation analyses of selected variables

Year	Pearson Correlation of MB with VAIC	Pearson Correlation of ROE with VAIC
2010	- 0.200**	- 0.112
2009	- 0.182**	0.030
2008	- 0.159***	0.046
2007	- 0.342*	0.022
2006	- 0.274*	- 0.011
2005	- 0.346*	0.111
2004	- 0.312*	0.208**
2003	- 0.120	0.352*
2002	- 0.105	0.325*
2001	- 0.033	0.263**

Note: **, * & *** represent level of significance at 1, 5 and 10 percent.

Table 1.3 Shows the Regression results of Market to book value with VAIC

Model 1: $MB_{it} = \alpha_0 + \beta_1 VAIC_{it} + \varepsilon_{it}$

Year	Independent variable	Co-efficient	t-statistics		
2010	Constant	1.564	5.718*	Adjusted R ²	0.029
	VAIC	- 0.243	- 1.956***	F-value	3.825**
2009	Constant	1.202	5.510*	Adjusted R ²	0.023
	VAIC	- 0.163	- 1.780***	F-value	3.169***
2008	Constant	1.685	7.029*	Adjusted R ²	0.015
	VAIC	- 0.157	- 1.558	F-value	2.428
2007	Constant	2.061	7.981*	Adjusted R ²	0.107
	VAIC	- 0.401	- 3.412*	F-value	0.117*
2006	Constant	1.718	7.465*	Adjusted R ²	0.064
	VAIC	- 0.290	- 2.598**	F-value	6.747**
2005	Constant	1.796	6.641*	Adjusted R ²	0.108
	VAIC	- 0.442	- 3.218*	F-value	10.353*
2004	Constant	1.621	4.955*	Adjusted R ²	0.084
	VAIC	- 0.463	- 2.671**	F-value	7.132**
2003	Constant	0.633	1.607	Adjusted R ²	- 0.001
	VAIC	- 0.185	- 0.965	F-value	0.932
2002	Constant	0.287	0.915	Adjusted R ²	- 0.005
	VAIC	- 0.135	- 0.842	F-value	0.709
2001	Constant	0.371	0.990	Adjusted R ²	- 0.016
	VAIC	- 0.046	- 0.255	F-value	0.065

Note: **, * & *** represent level of significance at 1, 5 and 10 percent.

SC = VA - HC

SCE = SC / VA

CEE = Capital Employed Efficiency

VA = Value added

Where,

CE = Capital employed taken as net worth of the company.

HCE = Human Capital Efficiency

HC = Total of wages and salaries of the employees

SCE = Structural capital efficiency and

SC = Structural capital

This method is considered relatively superior since it is based on the audited annual reports which are audited and easily available. This is also useful in comparison with other similar companies in the industry.

Return on Equity (ROE)

Return on equity measures a company's profitability by revealing how much profit a company generates from the shareholders' investment. It is calculated as

Return on Equity = Net Income/Average Shareholder's Equity

Table 1.4 Shows the Regression results of Market to book value with components of VAIC

$$\text{Model 2: } MB_{it} = \alpha_0 + \beta_1 CEE_{it} + \beta_2 HCE_{it} + \beta_3 SCE_{it} + \varepsilon_{it}$$

Year	Independent variable	Co-efficient	t-statistics		
2010	Constant	1.558	5.713*	Adjusted R ²	0.023
	CEE	0.066	0.642	F-value	1.735
	HCE	-0.234	-2.065**		
	SCE	0.017	0.029		
2009	Constant	1.301	4.262*	Adjusted R ²	0.016
	CEE	0.000	-0.002	F-value	1.492
	HCE	-0.203	-1.895***		
	SCE	0.240	0.536		
2008	Constant	1.692	6.622*	Adjusted R ²	0.012
	CEE	0.021	0.171	F-value	1.374
	HCE	-0.165	-1.812***		
	SCE	0.026	0.046		
2007	Constant	1.573	4.701*	Adjusted R ²	0.069
	CEE	0.082	0.619	F-value	0.101**
	HCE	-0.205	-1.589		
	SCE	-0.374	-0.849		
2006	Constant	1.778	5.171*	Adjusted R ²	0.061
	CEE	0.097	0.771	F-value	2.819***
	HCE	-0.298	-2.138**		
	SCE	0.181	0.351		
2005	Constant	0.839	2.030**	Adjusted R ²	0.122
	CEE	-0.065	-0.530	F-value	4.562*
	HCE	-0.111	-0.707		
	SCE	-0.941	-1.883***		
2004	Constant	0.487	0.682	Adjusted R ²	0.058
	CEE	-0.008	-0.074	F-value	2.367***
	HCE	-0.016	-0.056		
	SCE	-0.952	-1.122		
2003	Constant	0.872	1.393	Adjusted R ²	0.006
	CEE	-0.064	-0.510	F-value	1.129
	HCE	-0.335	-1.354		
	SCE	0.300	0.406		
2002	Constant	1.256	1.452	Adjusted R ²	-0.011
	CEE	-0.030	-0.239	F-value	0.768
	HCE	-0.503	-1.491		
	SCE	1.294	1.244		
2001	Constant	1.490	1.805***	Adjusted R ²	-0.011
	CEE	0.084	0.371	F-value	0.785
	HCE	-0.497	-1.359		
	SCE	0.982	1.484		

Note: *, ** & *** represent level of significance at 1, 5 and 10 percent.

Market to book value (MB)

Market valuation is measured by market to book value of the companies. It is calculated as total market capitalization divided by the book value of the companies.

Total market capitalization = Market share prices * No. of outstanding shares / book value of the shares

Average of 365 days is taken as the market price of the shares to represent the whole year and to avoid the market sentiments of any particular day.

Research Models

Here model I and model III are to check the association between intellectual capital efficiency with return on equity and market valuation of the companies. Model II and model IV will depict the relationship with components of VAIC i.e. capital employed efficiency, human capital efficiency and structural capital efficiency with ROE and MB.

$$MB_{it} = \alpha_0 + \beta_1 VAIC_{it} + \varepsilon_{it} \quad (I)$$

$$MB_{it} = \alpha_0 + \beta_1 CEE_{it} + \beta_2 HCE_{it} + \beta_3 SCE_{it} + \varepsilon_{it} \quad (II)$$

$$ROE_{it} = \alpha_0 + \beta_1 VAIC_{it} + \varepsilon_{it} \quad (III)$$

$$ROE_{it} = \alpha_0 + \beta_1 CEE_{it} + \beta_2 HCE_{it} + \beta_3 SCE_{it} + \varepsilon_{it} \quad (IV)$$

RESULTS AND ANALYSIS

Descriptive Statistics

Table 1.1 presents the descriptive statistics for both dependent and independent variables.

Table 1.1 shows the mean value of VAIC is highest 15.606 in the year 2009 and lowest 7.578 in the year 2004 which depicts that VAIC is considerably good and implies that the sample companies are generating intellectual capital efficiency in the selected time period of ten years. VAIC shows an increasing trend in the last five years but declined in the year 2010.

The mean value of MB used as the proxy for the market valuation of the companies ranges from 5.110 (2008) to 2.076 (2003) which indicates that investors of these companies

Table 1.5 Shows the regression results of return on equity with VAIC

Model 3: $ROE_{it} = \alpha_0 + \beta_1 VAIC_{it} + \varepsilon_{it}$

Year	Independent variable	Co-efficient	t-statistics		
2010	Constant	- 1.296	- 5.293*	Adjusted R ²	0.002
	VAIC	- 0.120	- 1.079	F-value	1.164
2009	Constant	- 1.602	- 7.335*	Adjusted R ²	- 0.010
	VAIC	0.027	0.291	F-value	0.085
2008	Constant	- 1.448	- 6.584*	Adjusted R ²	- 0.009
	VAIC	0.041	0.446	F-value	0.199
2007	Constant	- 1.432	- 5.924*	Adjusted R ²	- 0.011
	VAIC	0.023	0.207	F-value	0.043
2006	Constant	- 1.454	- 6.584*	Adjusted R ²	- 0.012
	VAIC	- 0.011	- 0.100	F-value	0.010
2005	Constant	- 1.745	- 6.710*	Adjusted R ²	- 0.001
	VAIC	0.128	0.972	F-value	0.945
2004	Constant	- 1.899	- 6.811*	Adjusted R ²	0.029
	VAIC	0.255	1.728***	F-value	2.987***
2003	Constant	- 2.440	- 8.294*	Adjusted R ²	0.110
	VAIC	0.421	2.961*	F-value	8.768*
2002	Constant	- 2.696	- 8.098*	Adjusted R ²	0.090
	VAIC	0.439	2.617**	F-value	6.848**
2001	Constant	- 2.205	- 8.060*	Adjusted R ²	0.052
	VAIC	0.265	2.021***	F-value	4.086**

Note: *, ** & *** represent level of significance at 1, 5 and 10 percent.

Table 1.6 Shows the regression results of return on equity with components of VAIC

$$\text{Model 4: } ROE_{it} = \alpha_0 + \beta_1 CEE_{it} + \beta_2 HCE_{it} + \beta_3 SCE_{it} + \varepsilon_{it}$$

Year	Independent variable	Co-efficient	t-statistics		
2010	Constant	- 1.000	- 4.340*	Adjusted R ²	0.105
	CEE	0.277	3.195*	F-value	4.643*
	HCE	- 0.140	- 1.466		
	SCE	0.221	0.442		
2009	Constant	- 1.251	- 4.123*	Adjusted R ²	- 0.003
	CEE	0.136	1.412	F-value	0.909
	HCE	- 0.053	- 0.498		
	SCE	0.356	0.800		
2008	Constant	- 1.201	- 5.433*	Adjusted R ²	0.099
	CEE	0.390	3.656*	F-value	4.498*
	HCE	0.039	0.495		
	SCE	- 0.168	- 0.345		
2007	Constant	- 1.248	- 4.279*	Adjusted R ²	0.067
	CEE	0.360	3.034*	F-value	3.096**
	HCE	0.048	0.421		
	SCE	- 0.011	- 0.030		
2006	Constant	- 0.854	- 2.768*	Adjusted R ²	0.129
	CEE	0.350	3.096*	F-value	5.155*
	HCE	- 0.093	- 0.742		
	SCE	0.769	1.664		
2005	Constant	- 1.348	- 3.627*	Adjusted R ²	0.139
	CEE	0.406	3.693*	F-value	5.148*
	HCE	0.087	0.612		
	SCE	0.084	0.187		
2004	Constant	- 0.440	- 0.813	Adjusted R ²	0.212
	CEE	0.311	3.730*	F-value	6.999*
	HCE	- 0.273	- 1.252		
	SCE	1.172	1.823***		
2003	Constant	- 0.260	- 0.586	Adjusted R ²	0.211
	CEE	0.134	1.474	F-value	6.605*
	HCE	- 0.373	- 2.150**		
	SCE	1.988	3.582**		
2002	Constant	0.712	1.042	Adjusted R ²	0.432
	CEE	0.386	3.757*	F-value	15.985*
	HCE	- 0.739	- 2.786*		
	SCE	3.324	3.993*		
2001	Constant	- 1.462	- 2.634*	Adjusted R ²	0.134
	CEE	0.393	2.341**	F-value	3.887**
	HCE	0.121	0.499		
	SCE	0.353	0.678		

Note: *, ** & *** represent level of significance at 1, 5 and 10 percent.

placing high value to the shares of the selected companies in comparison to the book value of the shares.

Mean value of ROE is used as the proxy for profitability from investors' perspective. It ranges from 0.338 to 0.231 which depicts that selected companies are generating desirable profits from the shareholders' investments.

Correlation Analysis

Table 1.2 shows the results of Pearson Correlation analyses and found market to book value of the selected companies are negatively related with the intellectual capital efficiency and found significant in the given time period. The reason for negative correlation may be that higher intellectual capital companies are undervalued in the Indian market. Return on equity was positively related with the intellectual capital efficiency.

Results of Linear Multiple Regressions

Table 1.3 represents the results of the model I where MB is dependent variable and VAIC is independent variable. Results show that VAIC is found to be significantly associated with market to book value in 6 out of 10 cases. Results suggest that Indian capital market still not reflecting the value on intellectual capital in its valuation and still may other factors which are more significant than intellectual capital efficiency.

Table 1.4 shows that in the components of intellectual capital, only human capital is significantly associated with intellectual capital only in 4 out of 10 cases. Structural capital is found to be associated only in a single year. In Model I the adjusted R^2 ranges from -0.016 to 0.107 and in model 2, it is -0.011 to 0.122 highlighting that model 2 is a better representation of the market valuation of the companies. Similar study by Zeghal & Maaloul (2010) found that VAIC and companies' stock market performance was significantly associated only in high-tech industry sectors among a sample of 300 UK companies. So, the above results may be because of the selected companies are representing the whole Indian market.

Firer & Stainbank (2008) did not found association between VAIC and market valuation of South African companies. But contradictory to our results Chen *et al.* (2005) found that VAIC was significantly and positively related with MB and three components were also positively significant with market valuation of the companies.

Table 1.5 shows the association of return on equity i.e. the return on the invested money of the shareholders. Results accepted the hypothesis that returns on equity is not associated with intellectual capital.

Table 1.6 presents the association with components of intellectual capital with return of equity and found that capital employed efficiency i.e. physical capital of the firms were more significant factors in the financial performance of the companies. But contrary to present results Maditious *et al.* (2011) have shown relationship between HCE and ROE in Greek companies. The study found no association between ROE and other financial performance with VAIC. Tin & Lean (2009) found that VAIC and ROA were positively related among the Malaysian finance sector.

FINDINGS AND CONCLUSION

The empirical finding from the study shows that market valuation of the company not reflecting the intellectual capital invested by them. The relationship between MB and VAIC was found significantly negative. The results of the return of equity are not encouraging for the investors. As still physical capital is dominating in Indian companies, results of the association of physical capital found to be majorly associated with return on equity.

This study covers almost all types of industries and therefore results would be more generalized in nature. Further more studies may be carried out covering a large number of companies and taking other indicators of the performance of the companies. Indian corporate sector can make use of the results in measuring the importance of the intellectual capital. Effective utilization of the intellectual capital can enhance the market valuation and return on equity but the same is not reflected from the results of the companies.

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