
Impact of Intellectual Capital on Firm Performance in Indian IT Companies

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Abstract: The relationship of intellectual capital and firm performance has shown mixed results that lead more attention among the research scholars in global. This study focus on the relationship between intellectual capital and financial performance of IT companies in India by using value-added intellectual capital coefficient (VAICTM) model. The researcher selected sample of 88 IT companies on the basis of market capitalization and compiled data from audited annual reports during the period of 2009-2018. Accordingly, the multiple regression results show that both VAIC and components of IC (except CEE) significantly predicted the financial performance of Indian IT companies. Besides, structural capital efficiency was found strong significant predator of ROA (0.299) and human capital efficiency in the case of sales growth (0.594). Thus, Indian IT companies advised to give more attention of investment in employees, management structure and policies to increase their financial performance.

Keywords: intellectual capital, financial Performance, Indian IT companies.

INTRODUCTION

In this technological era with the implementation of liberalization, globalization and privatization, many of the companies are facing large competition with their rivals. These intense competitions make the companies to develop strategic assets which cannot imitate by their competitor firm (Weqar & Haque, 2020). So the strategic assets such as knowledge and information, experience and expertise, research and development, relation and attitude towards the stakeholders, etc. play important role firms complete advantage. These intangible resources such as knowledge and information, experience and expertise and technology together constitute the intellectual capital (Mohammed & Irbo, 2018). Nowadays many organizations use intellectual capital for earning vast profit. These organizations believe that knowledge asset and intellectual capital is an important engine of production (Scafarto et al., 2016). Brennan (2000) stated that intellectual capital significant role for long term perspective of business. Hence measurement of intellectual capital is widely concern by investors, corporate decision makers, and policymakers. Every researcher have different concept about intellectual capital. Therefore there is no particular definition to explaining concept of intellectual capital. However the term IC may be interpreted as intangible asset or knowledge assets of a firm which have positively performed but not been explicitly listed in balance sheet (Bontis, 2001; Mondal & Ghosh, 2012).

Lev's (2001) defined IC being as source of value to a business that have been generated by or developed from innovation, unique organizational designs or human resource practices. In this definition it acknowledges that there are mainly three components of intellectual capital such as human capital, relational/customer capital and structural capital (Guthrie & Petty, 2000). Human capital encompasses with skill, knowledge and efficiency which were enhanced through the aid of training and these were taking the employees when they leave from firm. Sveiby (1997) defined human capital as "the capacity to act in a wide variety of situations to create both tangible and intangible assets". Customer capital or relational capital is directly linked to an organization and its relationship with stakeholders such as customers, resource providers, banks and shareholders. Therefore, customer capital is the knowledge that is embedded in the relationships with any stakeholder that affects the success or fail of firm's life. Sveiby (1997) defined relational capital as "relationships with customers and suppliers". However structural capital includes intangible knowledge which includes all non-human like, organizational structure, procedures, routines, systems, hardware, databases and organizational cultures and Administrative programs (Joshi et al., 2013). Sveiby (1997) defined structural capital as concepts, models, patents and computer and administrative systems. In simple SC is kind of intangible asset which remains the organization at the end of working day.

LITERATURE REVIEW

The relationship of Intellectual capital and financial performance is still confused paradox. Some studies shows positive relationship with financial performance and some shows negative. Also there is different result found in the relationship of IC components with financial performance.

Jabbar & Afza (2014) studied the relationship of IC with financial performance in textile and chemical industry in Pakistan. The result found that IC has significant relationship with profitability measures such as ROA and ROE in both textile and chemical industry. In textile industry, HCE have potential relation to financial performance whereas HCE shows insignificant with return on asset. Kim & Taylor (2014) studied the relationship of IC with share price of the company in Australian firm. They found that components of IC have significant positive relationship with share price while tangible asset have negative relation with share price. Baye et al. (2014) found that only capital employed efficiency have significant impact on the profitability of financial institutions in Cameroon financial institution companies, they also conclude that good understanding of IC measurement will make greater profitability in Cameroon financial institution companies. Another study shows that Physical and structural capital had a significant effect on the financial performance of Indonesian companies while human capital shows insignificant. They suggest that greater attention of intellectual capital will increase financial performance and also help to achieve competitive advantages (Budiandriani & Mahfudnurnajamuddin, 2014). Maditinos et al. (2011) had conducted a study on the Athens Stock Exchange and found that HCE was positively associated with profitability. Kamukama et al. (2011) found that Competitive advantage have a mediating role in the relationship between intellectual capital and financial performance in Uganda microfinance institution. Zeghal & Maaloul (2010) carried out a study on 300 firms in UK and found that only physical capital efficiency had a significant influence on the financial and stock market performance of the firms. Chen et al. (2005) in Taiwan found that human capital efficiency and physical capital efficiency had a significant impact on profitability, productivity, market valuation, and growth; whereas structural capital efficiency had significant impact only on profitability and market valuation. Mavridis (2005) found that human capital efficiency was more important for the performance of banks in Japan when compared to physical capital efficiency. Appuhami (2007) has failed to find any significant relationship between HCE and capital gains made by investors.

On other hand found Chang & Hsieh (2011) found that IC components have negative impact with financial and market performance. They also states that significant association of R&D expenditure efficiency (RDE), intellectual property rights (IPRs) with companies' operating, financial and market performance. it indicate R&D expenditure and IPRs are important for an organization to achieve competitive advantages.

RESEARCH OBJECTIVE AND HYPOTHESIS

Modern view indicates that investors, employees, suppliers, customers and other relevant stakeholders are together contributing the benefit to the firm. According to stakeholder theory "A system of stakeholders operating within the larger system of the host society that provides the necessary legal and market infrastructure for the firm's activities. The purpose of the firm is to create wealth or value for its stakeholders by converting their stakes into goods and services" (Clarkson, 1995). However resource based theory state that corporate performance is the result of efficient and effective use of tangible asset as well as intangible assets. Therefore, it may be argued that a firm with higher intellectual capital performance or intangible assets is expected to have higher rate operating profit and also it may be experience higher Return on asset and sales growth.

Hence, the study assume intellectual capital significant role in enhancing financial performance of the firm.

Based on this the study propose the following hypothesis.

H1: There is a positive relationship between value added intellectual coefficient (VAIC) and financial performance of Indian IT companies

This hypothesis is supported by several studies such Pulic (1997), in Austria, Kamath (2007) in India. The study also framed some hypothesis in respect to intellectual capital components.

H2: There is a positive relationship between human capital efficiency and financial performance of Indian IT companies

H3: There is a positive relationship between structural capital efficiency and financial performance of Indian IT companies

H4: There is a positive relationship between capital employed efficiency and financial performance of Indian IT companies

METHODOLOGY

Data collection: the study collected data's from CMIE data base. The study selected sample of 88 companies on the basis of market capitalization in the year 2018 and all those selected IT companies are listed on both NSE and BSE. The study used different proxy for measuring both dependent, independent and control variable. The multiple regression analysis used to check impact of independent and dependent variable.

Measure of Independent variables

The Value Added Intellectual Coefficient™ (VAIC™) developed by Ante Pulic (1998) forms the underlying measurement basis for the independent variable of the study. This method formalizes the following equation using IC components.

VAIC = Human Capital efficiency (HCE) + Structural Capital efficiency (SCE) + Capital employed efficiency (CEE)

Under this, the IC components is calculated by

Human Capital efficiency (HCE) = Value Added (VA) / Human Capital (HC),

HC= Personal cost (Salaries and Wages), this model employee related expense not considered expense instead it treated as an investment.

Structural Capital efficiency (SCE) = Structural capital (SC) / Value added (VA),

SC= VA-HC

Capital employed efficiency (CEE) = Value Added (VA) / Capital Employed (CE).

CA= Capital employed

Here, Value added (VA) is calculated as follows:

Value added (VA) = $VA = I + DP + D + T + M + R + W = W + I + T + NI$

I = Interest expenses; D = Dividends; T = Taxes paid; M = Equity of minority shareholders in net income of subsidiaries; R = Retained profits; W = Wages and salaries and NI = Profit after tax.

Alternatively,

VA can measure by using this formula

VA = OUTPUT – INPUT

OUTPUT refers to total revenue earned during the fiscal year by an organization, and INPUT refers operating expenses excluding those of employees.

Measure of dependent variables

The study used dependent variable as financial performance. For measuring financial performance three proxies are taken namely, operating profit, return on asset and sales growth. Each of this defined as follows.

Return on assets (ROA): it is used to measure the profitability of firm by showing the degree at which a firm's revenue exceeded over cost. It is calculate the by ratio of the net income (less preference dividends) divided by the book value of total assets.

$ROA = \text{Net Income} / \text{Average Total Assets}$

Sales Growth (SG): Increase in sales indicates that firm running in growth prospect. It shows the changes in current year sales over last year sales.

$GR = (\text{current year's sales} - \text{last year's sales}) / \text{last year's sales} * 100$

Control variables

The study uses control variable as follows

Firm size (SIZE): the size of firm is the natural logarithm of total asset of the firm. Here it is used to control firm size on financial performance.

$\text{Firm size} = \text{Log}(\text{total assets})$

Leverage (Lev): it is used control the impact of debt servicing on financial performance. Leverage is measured by the ratio of book value of total debt to book value of common equity (Lev and Sougiannis, 1996).

$\text{Leverage} = \text{total debt} / \text{total equity}$

Physical Capacity Ratio (PC): This ratio used to control the impact firms fixed asset to financial performance. It is measured by dividing fixed assets to total assets.

$PC = \text{fixed assets} / \text{total assets}$.

Research Model

Model 1 and model 3 examine the relationship between ROA and sales growth with aggregate measure of IC (VAIC™). Remaining models such as model 2 and model 4 used to analyze the relationship of intellectual capital components to firms ROA and sales growth. These models are illustrated by following equations.

Model 1: $ROA_{it} = \alpha + \beta_1 VAIC_{it} + \beta_2 DER_{it} + \beta_3 PC_{it} + \beta_4 AGE_{it} + \epsilon_{it}$

Model 1 analyzes the relationship between the efficiency of IC (VAICTM) and profitability (ROA) of the Indian IT industry. This model explore the first hypothesis that H1.

Model 2: $ROA_{it} = \alpha + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + \beta_4 DER_{it} + \beta_5 PC_{it} + \beta_6 AGE_{it} + \epsilon_{it}$

Model 2 analyze the relationship of VAIC components and ROA. This model explores the hypotheses H1a, H1b

Model 3: $SG_{it} = \alpha + \beta_1 VAIC_{it} + \beta_2 DER_{it} + \beta_3 PC_{it} + \beta_4 AGE_{it} + \epsilon_{it}$

Model 3 explore the relationship between IC (VAICTM) and Sales growth. This model justifies the hypothesis H2.

Model 4: $SG_{it} = \alpha + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + \beta_4 DER_{it} + \beta_5 PC_{it} + \beta_6 MBit + \epsilon_{it}$

Model 4 identify the relationship between IC components and Sales growth. This model justifies the hypotheses H2a, H2b.

RESULTS AND DISCUSSION

Descriptive Statistics

Variables	N	Mean	Std. Deviation	Maximum	Minimum
VAIC	112	4.1025	1.4938	16.1515	3.8956
HCE	112	2.3510	1.3678	15.3151	2.4845
SCE	112	0.4836	0.1528	2.0110	0.2786
CEE	112	0.4412	0.5965	6.2154	0.6559
ROA	112	0.1328	0.1008	0.5087	-0.2140
SG	112	0.2758	0.2015	1.8234	0.0364
DER	112	6.0128	7.1928	31.5951	3.0124
SIZE	112	7.9532	2.1412	17.0254	5.1745
PC	112	0.2128	2.0012	3.1451	0.0148

Table-1: Descriptive Statistics

Table 1 Show the mean and standard deviation of independent, dependent and control variables of 88 sample IT companies during the period of 2009- 2018. The result shows that mean value of VAIC is 4.1025 indicates that these sample companies effectively used intellectual capital for creating value for the firm. The table also shows mean value IC components i.e., HCE, SCE, CEE have respective mean value of 2.35, 0.48 and 0.44. It indicates thathuman capital is most effective components in creating value creation than structural capital and the capital employed. The mean value of profitability (0.13) and sales growth (0.2758) speaks that the financial performance of selected companies is good over the study period. So the overall economic performance of these companiesconsiderably high.

Correlation Analysis

	VAIC	HCE	SCE	CEE	ROA	SG	DER	SIZE	PC
VAIC	1								
HCE	0.489*	1							
SCE	0.528*	0.7090*	1						
CEE	0.198*	-.290*	-.298**	1					
ROA	0.211*	0.304*	0.049*	0.498*	1				
SG	0.296*	0.231*	0.029*	-0.090*	-0.028	1			
DER	-0.310	-0.032	0.086	-0.505*	-0.611*	-0.016	1		
SIZE	-0.153	0.067	0.253*	-0.360*	0.456*	0.062	0.718**	1	
PC	-0.162	-0.057	-0.101	-0.312**	-0.177*	-0.193*	-0.389*	-0.388*	1

Table-2: Correlation analysis, note: * 5% significance, **10% significance

Table 2 shows the correlation analysis of dependent, independent and control variables employed in this study. Result indicates that intellectual capital is significantly and positively correlated with the financial performance of sample companies by using the proxies such as return on assets and sales growth. Among the three components of IC, human capital efficiency and structural capital efficiency significantly and positively associated with return on asset and sales growth whereas capital employed efficiency has positive significant association between ROA and negative association with sales growth. Physical capacity of firm has negative association with financial performance indicators.

Multiple Regression Results

MODEL > INDEPENDENT VARIABLES	MODEL 1 ROA	MODEL 2 ROA	MODEL 3 Sales Growth	MODEL 4 Sales Growth
INTERCEPT	0.126* (2.332)	-0.058* (-0.185)	0.058 (-0.001)	-0.007 (-0.137)
VAIC	0.397* (1.859)		0.564* (3.265)	
HCE		0.233* (1.339)		0.594* (2.452)
SCE		0.299* (1.532)		0.298* (1.651)
CEE		0.252 (1.114)		0.078* (0.386)
DER	-0.166* (-0.731)	-0.063* (-0.388)	0.021* (0.156)	0.029 (0.336)
SIZE	-0.346* (-1.619)	-0.747* (-3.26)	0.059* (0.985)	-0.058 (-0.310)
PC	0.139 (0.769)	0.239* (1.542)	-0.069* (-0.483)	-0.069 (-0.501)
R2	0.264	0.425	0.512	0.612
F Value	2.775	2.820	4.958	4.988

Table 3 : Multiple regression Result, *5 % significance level, note: Values of t-statistics are provided in parenthesis

OLS regression has been used to identify the relationship between intellectual capital and financial performance of Indian IT companies. As study used panel data, Unit root test, Levin, Lin and Chu unit root test was applied before running the OLS regression for checking the stationarity of the data (Hausman, 1978). Results of the test show that reject the hypothesis of the unit root.

Result of regression model 1 found that intellectual capital has significant and positive impact on return on assets of all selected 88 companies. Thus, the study supports hypothesis H1. And therefore, the results accept that intellectual capital efficiency has a significant role to play in improving profitability of the firm. R square value indicates that only 26% explanatory power of independent variable to explain the ROA. Among the control variables debtor's equity ratio and size of firm shows negative association with the return on assets. These empirical results support the result of Afroz et al. (2018), Ghosh & Mondal (2009) and Ginesti et al. (2018) who proved an insignificant effect of VAIC on ROA. Model 2 represents components wise impact on return on assets (ROA). This model used to test the hypothesis of H1a, H1b, and H1c. The result of model 2 in Table 3 shows human capital efficiency and structural capital efficiency are significantly and positively related to return on assets whereas capital employed efficiency does not show any significant relation to return on asset. These empirical results of model 2 support H1a, H1b while reject H1c. R square shows these components have 42.5% explanatory power to explain Return of assets of the firm. The entire control variable such as debtor's equity ratio, size of firm and physical capacity have negative impact on ROA.

Model 3 results show that IC efficiency has significant impact on sales growth of selected companies. It indicates that improvement of intellectual capital of the firm leads to increase growth of sales. This result leads to accept hypothesis H2. This result has shown 52% explanatory power to sales growth by intellectual capital. Among the control variables debtor's equity ratio and size of firm shows significant positive association with the sales growth whereas physical capacity (PC) shows negative association to sales growth.

Model 4, three components of VAIC are employed as a predictor of sales growth. Result indicates that all the components have significant positive impact on growth of sales. Human capital efficiency has high coefficient value compared to capital employed and structural capital. It indicates investment in employee leads to increase the growth sale of the organization.

Study also found that both size and physical capacity of firm have negative impact on growth rate. It indicates that size of firm and physical capacity increase, lesser will be the profitability and sales growth of the firm. These empirical results of model 2 accept H2a, H2b and H2c.

CONCLUSION

The relationship between intellectual capital and financial performance shown mixed result in different sectors context. Pulic's VAICTM model used to measure intellectual capital performance and OLS regression used to measure the association between intellectual capital and performance of Indian IT companies. For the purpose, 88 Indian IT companies were assessed and their annual financial reports were used to calculate their performance as measured by ROA and sales growth from 2009-2018.

The result of the study indicate that intellectual capital efficiency have is positively influence on both ROA and sales growth. It means greater attention on intellectual capital gives high profitability as well as high sales growth to the firm. IC components wise result shows that all the components such as HCE, SCE, and CEE have significant relation with sales growth of the firm. Among this HCE is a highly significant predictor of sales growth followed by structural capital and capital employed respectively. These indicate that investment in training and development of employees leads increase the efficiency of profitability. Similarly relation to return assets shows that, all the components except CEE have significant relation to return on assets of the firm. Capital employed efficiency does not show any relationship. Among these components SCE is highly predator of return on asset. It indicates management structure and management policies have highly influence on firm return on assets.

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