



## CORPORATE INTELLECTUAL EFFICIENCY AND ITS IMPACT ON FINANCIAL PERFORMANCE OF IT SECTOR IN INDIA: APPLICATION OF E-VAIC MODEL

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**Abstract:** Intellectual capital is increasingly being acknowledged as a key driver of economic growth. This paper focuses on measuring corporate intellectual efficiency and its impact on financial performance of Indian IT sector. Five years study period has been covered and five IT companies has been considered for this study. Contribution of this sector in GDP is gradually increasing in this tech era. Intellectual capital efficiency has been measured through EVAIC model, developed by Pulic. Financial performance has been measured through NPM, ATO & CR ratios. Corporate intellectual efficiency communicates about how well it utilizes its resources, especially the human capital and their knowledge. Financial ratios are traditionally established measure of how well a firm performs financially. Regression results showed statistically significant impact of intellectual capital efficiency on ATO & CR but not on NPM. Prediction level for variations is also low in case of NPM ratio and it is obvious as profit margin ratio is affected by so many other factors which are volatile. Though other profitability ratios might have good fit regression model.

**Keywords:** Intellectual capital efficiency, Financial Performance, IT sector

### ABBREVIATIONS

ATO – Assets Turnover Ratio

CR – Current Ratio

EVAIC – Extended Value Added Intellectual Capital Coefficient

GDP – Gross Domestic Product

IT SECTOR – Information Technology Sector

NPM – Net Profit Margin

### **I. INTRODUCTION**

Intellectual capital is increasingly being acknowledged as a key driver of economic growth. Inadequacy of physical resources, rapidly changing technology, heightened competition and globalization are some of the factors that have brought economic performance under pressure in the past few years.

In simple words corporate intellectual efficiency means efficiency of any business organisation, how well it utilizes its resources, especially the human capital and their knowledge.

According to Roos, Pike and Fernstrom (2005) “Intellectual Capital can be define as all non-monetary and nonphysical resources that are fully or partially controlled by the organization and contribute to the organization’s value creation”.

Edvinson and Malone (1997) defined IC as “knowledge that can be converted into value.”

## II. THE VAIC METHOD

The Value Added Intellectual Coefficient (VAIC) method was developed by Alen Pulic, professor at the University of Zagreb and Graz, the Austrian founder of Intellectual Capital Research Centre. VAIC<sup>TM</sup> method depends on the concept of value added as the measure of performance, relative to intellectual capital. It comprises of the sum of three component ratios, i.e. human capital efficiency (HCE), structural capital efficiency (SCE), and capital employed efficiency (CEE).

VAIC coefficient indicates the amount of value created per monetary unit invested in tangible and intangible resources of the business.

Eventually many researchers have formulated modified versions of this model to make it more apt with the changing time and corporate structure.

The existing VAIC model has been extended by adding Relational Capital to the other elements of IC. This extended and modified VAIC (E-VAIC) model has been applied to measure the efficiency of IC and its elements and to link the same with financial performance of service sector companies in India.

## III. REVIEW OF LITERATURE

**3.1 Ihyaul Ulum, Imam Ghozali, Agus Purwanto (2014)**, has studied on 'Intellectual capital performance of Indonesian banking sector through modified VAIC perspective', for the period of 2009 – 2012. On the basis of M-VAIC scores, performance of intellectual capital was classified into four categories, Top performers, Good Performers, Common performers and Bad Performers. Here, by adding one more components, i.e., RCE- Relational Capital Efficiency to the VAIC model, power of this method was increased for measuring and predicting the value creation by Intellectual capital. Regression results showed that components: HC, SC & CE as the function of value added contribute more than 80%.

**3.2 Al Matarneh, A.S. (2014) (Jordan)**, an empirical study was conducted from the data drawn of 51 listed companies on Amman stock exchange from 2007 to 2012. For the measurement model of intangible capital and its components using a value added intangible capital (VAIC) by Pulic model, and its effects on five performance indicators included Return on Equity, Return on Assets, Growth Revenue, Shareholder's value creation and the ratio of market value to book value per share were analyzed by regression models. Results showed that there was a significant relationship of intangible capital with market value and financial performance of all the companies.

**3.3 Majid Dadashinasab, Seyyed Ahmad Mousavi, Behzad Ghorbani, and Mohammad Khatiri (2015)**, have studied on 'Intellectual capital performance of financial institutions in Iran'. Data of firms listed in the Teheran stock exchange for the period of 2007 to 2012 was taken to investigate the intellectual capital performance and its association with financial performance of banks and financial institutions in Iran. Regression model results described positive and significant relationship among VAIC, HCE, SCE & financial performance. CEE had negative and insignificant relationship with financial performance.

**3.4 Narwal, K.P. and Yadav, N. (2017)**, Interrelationship of IC and its elements with the performance of the Indian real estate sector for the time period of 2005 to 2015 has been examined. Pearson correlation and OLS regression were used to examine the relationships among variables that are explaining value creation activity. Findings revealed that value added intellectual coefficient indicated a positive and significant association with the profitability of the Indian real estate sector.

**3.5 Vitalis, E. (2018) (Nigeria)**, For this study, data of 40 companies listed on Nigerian stock exchange were collected for the period of 15 years, 2001 to 2015. Effect of intellectual capital measured by Pulic's model on financial performance measured by, ROA, ROE, ATO and market to book value were investigated with the help of multiple regression. Results showed that intellectual capital affected significantly to ROA and ROE while not to ATO and Market/Book value.

## IV. RESEARCH METHODOLOGY

### 4.1 objectives of the study

1. To calculate the value added by intellectual capital of Indian IT sector during the period of study.
2. To empirically investigate the impact of intellectual capital efficiency on the financial performance of IT sector in India.

### 4.2 Period of the study

The period of the study covers data of five years commencing on 2015-16 and ending on 2019-20.

### 4.3 Sampling

A knowledge based service sector, i.e., IT sector of India has been selected for the study. Top five companies listed on BSE/NSE based on their net sales have been selected from the IT sector.

1. Infosys Limited
2. Wipro Limited
3. Tech Mahindra Limited
4. Larsen & Toubro Infotech Limited
5. Mphasis Limited

#### 4.4 Sources of data

The study is based on secondary data. Information required for the study is collected from the annual reports of the selected companies, various books, reports and internet sources.

#### 4.5 Framework of analysis

For the purpose of studying impact of intellectual capital efficiency on financial performance measurement, regression analysis has been conducted. Independent variable, EVAIC coefficient represents corporate intellectual efficiency and dependent variables consist of NPM, ATO & CR ratios to represent financial performance.

$$\text{E-VAIC} = \text{HCE} + \text{SCE} + \text{RCE} + \text{CEE}$$

$$\text{VA} = \text{OP} + \text{EC} + \text{D} + \text{A}$$

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

$$\text{SCE} = \text{SC} / \text{VA}$$

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

$$\text{RCE} = \text{RC} / \text{VA}$$

$$\text{Net Profit Margin Ratio} = \frac{\text{Net Profit After Tax}}{\text{Net Sales}} \times 100$$

$$\text{Asset Turnover Ratio} = \frac{\text{Net Sales}}{\text{Average Total Assets}} \times 100$$

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

#### 4.6 Significance of the study

- The study findings may be of great significance to the management as it directs for better utilization of intellectual capital to increase the financial performance of the company.
- The concept of the study is useful for the valuation of the firm.
- The results obtained by application of E-VAIC model in a firm can form the basis of justification for investment in a particular class of Intellectual Capital.

#### 4.7 Limitation of the study

- The study carries all the limitations, inherent with the secondary data and information.
- Limitations linked with - accounting tools, statistical techniques, and techniques to measure intellectual capital: also apply for this research work.
- The research study covers time period of five years, which might be insufficient for generalisation.
- The research study focuses on selected service sector industry here, which will be too narrow to establish any standard theory for whole economy.

## V. RESULTS AND DISUSSION

**Table 5.1:** Descriptive Statistics of the Independent and Dependent Variables

		Infosys	Wipro	Tech M	L&T Info	Mphasis
EVAIC	MEAN	2.75	2.48	2.75	3.17	3.00
	S.D.	0.06	0.07	0.12	0.36	0.34
NPM	MEAN	22.53	17.27	15.4	16.11	21.80
	S.D.	2.65	0.93	1.39	0.84	4.33
ATO	MEAN	84.04	74.78	94.70	144.19	68.06
	S.D.	10.65	2.29	5.56	18.09	12.10
CR	MEAN	3.53	3.02	2.67	2.73	3.24
	S.D.	0.55	0.29	0.38	0.54	1.18

(Source: Computed by Authors from annual reports)

In table 5.1, Data for EVAIC (Extended Value Added Intellectual Capital Coefficient) displayed that L & T INFO has highest average but with the highest amount of inconsistency in the performance. INFOSYS has the most consistent performance.

Data for NPM (Net Profit Margin) showed that INFOSYS & MPHASIS scored better on average as mean score of those companies are higher than others but both companies also had a larger standard deviation which shows that companies had inconsistent NPM ratio. Average wise INFOSYS is on the top but consistency wise L & T INFO is on the top.

Data for ATO (Assets Turnover Ratio) displayed that L & T INFO scored better on average as mean score of it is the highest but it has highest standard deviation also, which showed high inconsistency in the performance. Consistency wise WIPRO is on the top.

Data for CR (Current Ratio) showed that Average wise INFOSYS is on the top but consistency wise WIPRO tops the list.

### Hypothesis Testing

H<sub>0</sub>: The EVAIC has no significant impact on financial performance (as measured by NPM, ATO & CR ratio) of IT sector.

H<sub>1</sub>: The EVAIC has significant impact on financial performance (as measured by NPM, ATO & CR ratio) of IT sector.

**Table 5.2 Regression Results For Impact of EVAIC On Selected Financial Performance Measures**

	NPM	ATO	CR
N	25	25	25
R <sup>2</sup>	0.04	0.40	0.25
P- Value	0.3250	0.0007	0.0104
Coefficient	2.41	58.12325	-1.092772

The regression model presented in table 5.2, for NPM ratio indicates that 4% of the variation in the NPM ratio can be explained by EVAIC, which is up to a very low extent. The P- value is 0.33, which is greater than the significance level of 0.05. Hence, null hypothesis has to be accepted as and it is concluded that there is no statistically significant impact of EVAIC on NPM ratio. The positive coefficient explains that for each percent increase in EVAIC, the average expected increase in the NPM ratio is 2.41 percent.

The regression model for ATO ratio indicates that 40% of the variation in the ATO ratio can be explained by EVAIC, which is up to a moderate extent. The P- value is 0.000, which is less than the significance level of 0.05. Hence, alternate hypothesis will be accepted at 1%/ 5%/ 10% significance level and it is concluded that there is statistically significant impact of EVAIC on ATO ratio. The positive coefficient explains that for each percent increase in EVAIC, the average expected increase in the ATO ratio is 58.12 percent.

The regression model for CR ratio indicates that 25% of the variation in the CR ratio can be explained by EVAIC, which is up to a low extent. The P- value is 0.01, which is less than the significance level of 0.05. Hence, alternate hypothesis will be accepted at 5%/ 10% significance level and it is concluded that there is statistically significant impact of EVAIC on CR ratio. The negative coefficient explains that for each percent increase in EVAIC, the average expected decrease in the CR ratio is 1.09 percent.

## VI. CONCLUSION

“You cannot manage what you cannot measure”. This phrase, which has entered the literature of management emphasizes that as a consequence of increasing importance of intellectual capital for enterprises, it is obligatory to manage intellectual capital, and for this, it is inevitable to measure intellectual capital. As developing economies move on the path of globalization and liberalization, service sector is playing a leading role in the growth of these economies. In India, share of tertiary sector in gross domestic product has crossed the fifty percent mark. This service sector, comprises of knowledge intensive industries, produces lot of intangible goods and consisting a bulk of intellectual capital. Therefore, it is essential to analyze the role of intellectual capital in the performance of Indian service sector. Marr et al (2003) have documented reasons to consider and measure intellectual capital: 1. Help organizations to formulate strategies 2. Evaluate the performance of strategies 3. Help to expansion and diversification decisions 4. Use the results of measuring intellectual capital as a basis for service quality 5. Notify these assets to external stakeholder of organizations.

For the last 20 years, India is occupying a vital position in the area of Information Technology. It became one of the key service businesses of the country. India has the largest software skilled population in the world. The domestic market as well as the international market has grown substantially. Even realizing the potential for this area many state governments have made IT as their most, prioritized segment in many states. To make the process of value creation by intellectual capital more clear, it is urgently required that policy makers start voluntary disclosure of the IC, in order to promote the knowledge about the concept and importance of intellectual capital. Companies should utilize firm’s total resources strategically and efficiently so as to add better value to the business. The accounting bodies need to formulate intellectual measurement techniques that can be adopted by companies. Standardized disclosure and reporting norms should be indicated and be made mandatory for all firms so that business organizations start taking cognizance of the unleashed potential.

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