

A Comparison on the performance of intellectual capital over the selected Indian enterprises- An Analytical approach

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Abstract

The study focused to analyse the effect of intellectual capital and its components ie. Human capital, Structural capital and Relational capital on the business performance and sustainable growth of the selected enterprises in India. To determine the value addition from this intellectual capital for these enterprises, this study analysed secondary data from a variety of sources, including the annual reports of these corporations and websites like money control. The Value added intellectual coefficient (VAIC) approach is used to measure intellectual capital and also this is taken as the independent variable. Business performance and sustainability growth rate were taken as the dependent variables. The indicator of business performance was highlighted using return on assets. Data analysis was done using the panel data regression to examine the effect of intellectual capital and its components on these enterprises' business performance. To determine if a fixed effect test or random effect test is necessary for the investigation, the Hausman Test was used. The performance of intellectual capital and its components within the chosen enterprises was also examined using the one sample t test to see whether there were any differences. Thus the results highlights that the most important factor influencing the performance of Indian enterprises is discovered to be human capital and also the effects of physical capital, human capital, structural capital and relational capital are all favorable for business sustainable growth. Finally, a significant difference existed between the enterprises was highlighted from the one sample t test.

Key words: Human capital, Structural capital and Relational capital, intellectual capital

Introduction

Corporate management has given increased consideration to the value of intellectual capital as technologically advanced enterprises have grown quickly in the knowledge-based economy. IC is viewed as a driver of business competitiveness and financial sustainability. In accordance with the resource-based view (RBV), enterprises are more likely to acquire a sustained competitive advantage if their resources are valuable and constrained. Intellectual capital is an important concern in the age of information, and as we move into the third millennium, it has become more valuable than physical strength, mechanical strength, or even technical power. A transformation from an industrial to a knowledge-based economy, the dissolution of physical and material capitals, and the importance of non-material assets like human, knowledge, intellectual, and social capital are some of the most significant aspects of this era that have drawn researchers' attention more than other aspects. Nevertheless, most companies throughout the world still rely on archaic financial accounting practices that were developed decades ago for physical work and intangible asset-based organizations. Due to the

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growing significance of this unrecognized capital (intellectual capital) in business profitability ratios, financial performance, and ultimately success or failure in today's complicated and competitive climate, the current research is both important and necessary. On the other hand, due to the significance of corporate life cycles and their impact on corporate performance, the impact of intellectual capital on earnings per share can be examined and analyzed over the life cycles of companies, as most information users should be aware of the stage of their life cycles and whether the interest payments or corporate dividend policy is correct or whether it should be in a way that the company does not (Chen et al., 2004).

2. Review of Literature

Saraswati, N. K. (2022) was confirmed that, between 2015 and 2019, the financial performance of the property and real estate companies listed on the Indonesian stock exchange was influenced by intellectual capital. 34 companies were discovered using the study's purposive sampling technique out of a total of 170 observations. Value added structural capital, value added human capital, and value added capital employed were used in the study as independent variables, while return on assets was used as the dependent variable to quantify financial success. Finally, the outcomes showed that intellectual capital had influenced the chosen enterprises' financial success.

Sunarsih, N. M & Dewi N. P. S. (2019) studied how intellectual capital affected the value of manufacturing companies listed on the Indonesian stock exchange between 2015 and 2017. Based on the purposive sample strategy, 204 manufacturing companies were chosen for the study. Multiple linear regression analysis was the type of statistical analysis used. Thus, it was determined from the results that intellectual capital increased corporate value.

Xu, J., & Wang, B. (2018) empirical research on how intellectual capital affects financial performance and long-term growth in the Korean manufacturing sector. 390 manufacturing enterprises with shares listed on the Korean stock exchange during the years of 2012 and 2016 provided the data for this study. The findings of the multiple regression analysis revealed that, despite the positive correlation between a company's financial success and sustainable growth and its physical capital, it was human and relational capital that had the largest influence over these results.

Research Methodology

3.1 Objectives of the study:

1. To examine the effects of intellectual capital and each of its components separately on the business performance and sustainable growth of the selected industrial firms.
2. To compare the performance of intellectual capital and its components between the selected manufacturing and service sector industries.

3.2 Sample Selection:

1. Chemical industry from Manufacturing sector and Media industry from service sector has been selected for the purpose of analysis.
2. The statistical population of this research includes companies accepted under Nifty indexed between 2012 and 2021.

3.3. Research Variables:

(1) Dependent variables: Based on previous literatures, Return on assets (ROA) and Return on equity (ROE) are usually applied to monitor the business performance.

Sustainable growth rate (SGR) is commonly implemented to plan long-term, sustainable growth, capital purchases, cash flow estimates, and borrowing strategies. The formula, as recommended by Higgins and Zhang and Chen is as follows,

$$SGR = \text{Net profit ratio} \times \text{Asset turnover ratio} \times \text{Retention rate} \times \text{Equity multiplier}$$

(2) Independent variables: Capital employed efficiency (CEE), Human capital efficiency (HCE), Structural capital efficiency (SCE) which constitutes Value added intellectual coefficient (VAIC) were considered as the independent variables. The following are the requirements for calculating VAIC,

$VA = C + D + A + OP$, where VA is the net value a specific company generated over the course of the year; C stands for employee's salary, D for depreciation, A for amortisation, and OP for operating profit.

(3) Control variables: According to prior studies, **the firm size** is calculated as the natural logarithm of total assets and **leverage** is calculated as the ratio of total debt to total assets.

3.4 Research Hypothesis:

- There is no significant association between intellectual capital & its components and business performance.
- There is no significant association between intellectual capital & its components and sustainable growth rate.
- There is no significant difference between the performance of intellectual capital and its components between the selected manufacturing and service sector industries.

3.5. Models:

The association between business performance and the total measure of VAIC and its three components is examined using models (1) & (2), respectively

$$B.Perf_{i,t} = \beta_0 + \beta_1 VAIC_{i,t} + \beta_2 Size_{i,t} + \beta_3 Leverage_{i,t} + \epsilon_{i,t} \quad (1)$$

$$B.Perf_{i,t} = \beta_0 + \beta_1 CEE_{i,t} + \beta_2 HCE_{i,t} + \beta_3 SCE_{i,t} + \beta_4 Size_{i,t} + \beta_5 Leverage_{i,t} + \epsilon_{i,t} \quad (2)$$

To determine whether the IC variables have an impact on businesses' sustainable growth, models (3) & (4) are implemented,

$$SGR_{i,t} = \beta_0 + \beta_1 VAIC_{i,t} + \beta_2 Size_{i,t} + \beta_3 Leverage_{i,t} + \epsilon_{i,t} \quad (3)$$

$$SGR_{i,t} = \beta_0 + \beta_1 CEE_{i,t} + \beta_2 HCE_{i,t} + \beta_3 SCE_{i,t} + \beta_4 Size_{i,t} + \beta_5 Leverage_{i,t} + \epsilon_{i,t} \quad (4)$$

4. Analysis and Interpretation

4.1 Panel data Regression results:

Panel data regression results of chemical industry:

Regression results of model (1)&(2)

Table 1- *The effect of intellectual capital on the return of assets of the chemical industry*

Variable	Coefficient	Std. Error	t statistic	Probability
C	13.08412	1.329567	9.840887	0.0000
VAIC	0.029592	0.047748	0.619744	0.0350
Size	-1.174816	0.947275	-1.240205	0.2187
Leverage	-8.396695	2.147984	-3.909105	0.0002

Significant at 5% level

Adjusted R² = 0.811334 Durbin Watson statistic = 1.730917

Table 2 -The effect of intellectual capital on the return on equity of the chemical industry

Variable	Coefficient	Std. Error	t statistic	Probability
C	17.36196	2.361035	7.353539	0.0000
VAIC	1.593545	2.100576	0.758623	0.0558
Size	-1.341900	1.191536	-1.126194	0.2636
Leverage	-6.018666	2.701854	-2.227606	0.0289

Significant at 5% level

Adjusted R² = 0.509411 Durbin Watson statistic = 1.811835

Computed using E views software

Table 1& 2 indicates the panel data regression results showcasing the effect of overall intellectual capital (VAIC) on return on assets (ROA) and return on equity (ROE) for chemical industry. The result of this study reveals that there exists a positive and a significant impact of intellectual capital on the business performance of the chemical industry which has used return on assets (ROA) and return on equity (ROE) as a proxy at 5% level, thereby accepting the alternative hypothesis.

Table 3- The effect of elements of intellectual capital on the return on assets of chemical industry

Variable	Coefficient	Std. Error	t statistic	Probability
C	13.24015	2.547157	5.198011	0.0000
CEE	3.613954	5.743656	0.629208	0.5312
HCE	-0.565352	0.763686	-0.740293	0.0813
SCE	0.034598	0.074659	0.463410	0.6444
Size	-1.283498	0.951662	-1.348690	0.1815
Leverage	-10.00164	2.801965	-3.569508	0.0006

Significant at 5% level

Adjusted R² = 0.905833 Durbin Watson statistic = 2.065950

Table 4- The effect of elements of intellectual capital on the return on equity of the chemical industry

Variable	Coefficient	Std. Error	t statistic	Probability
C	16.97083	3.126242	5.428509	0.0000
CEE	15.10306	7.049452	2.142444	0.0354
HCE	-0.006622	0.091632	-0.072270	0.0343
SCE	-0.006622	0.091632	-0.072270	0.9426
Size	-1.124208	1.168019	-0.962492	0.3389
Leverage	-11.27916	3.438981	-3.279797	0.0016

Significant at 5% level

Computed using E views software

Adjusted R² = 0.791488 Durbin Watson statistic = 1.686184

Table 3& 4 has showcased the influence of each constituents of intellectual capital (VAIC) on the business performance where return on assets and return on equity were used as its proxy after controlling the influence of leverage and firm size. Among the three components of intellectual capital the coefficients of human capital efficiency (HCE) is found to be positive and significant at 5% level of significance for both ROA and ROE while the remaining two components are positive yet insignificant. The control variables i.e. size and leverage are insignificantly associated with ROA and ROE.

Regression results of model (3) &(4):
Table 5 –The influence of intellectual capital on the sustainable growth rate (SGR)

Variable	Coefficient	Std. Error	t statistic	Probability
C	11.82590	1.638967	7.215461	0.0000
VAIC	0.086300	0.058859	1.466206	0.1467
Size	-4.276561	2.603134	-1.642851	0.1045
Leverage	-0.703609	1.155351	-0.609000	0.5443

Computed using E views software

Significant at 5% level

Table 6 -The influence of components of intellectual capital on the Sustainable growth rate (SGR)

Variable	Coefficient	Std. Error	t statistic	Probability
C	11.93487	3.131656	3.811040	0.0003
CEE	6.133640	7.061661	0.868583	0.3879
HCE	-0.688930	0.938930	-0.733739	0.4654
SCE	0.089179	0.091791	0.971548	0.3344
Size	-6.384880	3.444936	-1.853410	0.0678
Leverage	-0.639743	1.170042	-0.546770	0.5862

Computed using E views software

Significant at 5% level

 Adjusted R² = 0.209183 Durbin Watson statistic = 1.876279

Under table 5 and 6 presents the effects of intellectual capital as well as each of its components on the sustainable growth rate of the chemical industry .The results reveals that an insignificant yet positive association is observed among the intellectual capital as well as among allthe components of intellectual capital. The coefficient estimates of leverage and firm size are observed to be positively associated with the sustainable growth rate but their results were insignificant at 5% level, thereby accepting the null hypothesis.

Panel data regression results of media industry

Regression results of model (1) &(2)
Table 7- The effect of intellectual capital on the return of assets of media industry

Variable	Coefficient	Std. Error	t statistic	Probability
C	24.25533	1.994921	12.15854	0.0000
VAIC	-3.537635	2.745546	-1.288500	0.0014
Size	6.459577	7.607287	0.849130	0.4284
Leverage	1.278946	6.266972	0.204077	

Significant at 5% level

 Adjusted R² = 0.428742 Durbin Watson statistic = 2.193407

Table 8 - The effect of intellectual capital on the return on equity of media industry

Variable	Coefficient	Std. Error	t statistic	Probability
C	27.79946	0.874624	31.78449	0.0000
VAIC	-5.741221	1.203716	-4.769581	0.0031
Size	-1.266528	2.747598	-0.460958	0.6611
Leverage	0.223942	3.335225	0.067144	0.9486

Significant at 5% level

Adjusted R² = 0.800416 Durbin Watson statistic = 2.654546

Table 7 and 8 presents the panel data regression for model 1. It is found that VAIC has a significant positive association with ROA and ROE. The VAIC coefficient value can be interpreted as one per cent increase in the value of VAIC leads to a corresponding 0.969 per cent change in ROA. Thus, the null hypothesis is been rejected thereby indicating a significant association between IC and corporate performance. Likewise both control variables i.e. firm size and leverage are found to have a positive but an insignificant association with ROA & ROE.

Table 9- The effect of elements of intellectual capital on the return on assets of media industry

Variable	Coefficient	Std. Error	t statistic	Probability
C	31.03253	5.167941	6.004815	0.0039
CEE	-9.547687	17.61898	-0.541898	0.6167
HCE	0.096045	0.598199	0.160558	0.8802
SCE	-8.007154	7.330346	-1.092329	0.3361
Size	0.445363	4.950050	0.089971	0.9326
Leverage	-4.008164	4.360168	-0.919268	0.4100

Significant at 5% level

Adjusted R² = 0.585049 Durbin Watson statistic = 2.591372

Table 10 - The effect of elements of intellectual capital on the return on equity of media industry

Variable	Coefficient	Std. Error	t statistic	Probability
C	17.20660	9.922744	1.734057	0.1579
CEE	22.28013	33.82946	0.658601	0.5461
HCE	0.058207	1.148576	0.050678	0.9620
SCE	-0.970284	14.07469	-0.068938	0.9483
Size	1.056162	8.371773	0.126157	0.9057
Leverage	4.201760	9.504381	0.442087	0.6813

Significant at 5% level

Adjusted R² = 0.556960 Durbin Watson statistic = 2.046281

Computed using E views software

Table 9 & 10 has showcased the influence of each constituents of intellectual capital (VAIC) on the business performance where return on assets and return on equity were used as its proxy after controlling the influence of leverage and firm size. All the three components of intellectual capital are found to be positive yet insignificant at 5% level of significance for both ROA and ROE. The control variables i.e. size and leverage are insignificantly associated with ROA and ROE.

Table 11 - The effect of intellectual capital on the sustainable growth rate of media industry

Variable	Coefficient	Std. Error	t statistic	Probability
C	10.61856	5.771811	1.839728	0.1154
VAIC	-4.837915	7.943556	-0.609036	0.5648
Size	14.86857	22.00980	0.675543	0.5245
Leverage	19.05848	18.13193	1.051100	0.3337

Computed using E views software

Significant at 5% level

Adjusted R² = 0.086487 Durbin Watson statistic = 2.214656

Table 12 - The effect of elements of intellectual capital on the sustainable growth rate of media industry

Variable	Coefficient	Std. Error	t statistic	Probability
C	55.77355	16.53441	3.373180	0.0280
CEE	-157.5688	56.37052	-2.795233	0.0490
HCE	-0.887199	1.913890	-0.463558	0.6671
SCE	-12.60872	23.45285	-0.537620	0.6194
Size	10.33273	13.95001	0.740697	0.5000
Leverage	25.11742	15.83729	1.585968	0.1879

Computed using E views software

Significant at 5% level

Adjusted R² = 0.431236 Durbin Watson statistic = 2.595759

Under table 11 and 12 highlights the influence of intellectual capital as well as each of its components on the sustainable growth rate of the media industry .The results reveals that an insignificant yet positive association is observed among the intellectual capital as well as among allthe components of intellectual capital. The coefficient estimates of leverage and firm size are observed to be positively associated with the sustainable growth rate but their results were insignificant at 5% level, thereby accepting the null hypothesis.

One sample t test:

Table 13: One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAIC	142	13.233	11.3339	.9511
Manufacturing				
VAIC Service	22	5.411	3.2187	.6862

Computed using SPSS software

Table 14: One-Sample Test

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
VAIC	13.913	141	.000	13.2326	11.352	15.113
manufacturing						
VAIC service	7.886	21	.000	5.4114	3.984	6.838

Computed using SPSS software

Table 14 highlights a comparative analysis of intellectual capital performance between chemical industry from manufacturing sector and media industry from service sector. This difference is found to be significant at 5% level of significance. It results in acceptance of alternative hypothesis thereby there exists a significant difference between values of VAIC of both the industry.

Conclusions

Intellectual Capital is becoming more widely acknowledged as a key factor in boosting company sustainability and competitiveness. The primary findings of this study, which were based on information from the selected Indian industries listed under National stock exchange, are as follows:

- (1) Greater profitability and higher sustainable growth are attained by Indian industries with better IC efficiency.
- (2) The most important factor influencing the performance of Indian manufacturing enterprises is discovered to be Human Capital.
- (3) The effects of physical capital, human capital, structural capital and relational capital are all favorable for business sustainable growth.

The findings could have some significant practical significance,

- (1). In order to preserve a competitive advantage, Indian firms should continue to recognize the value of IC and increase their investment in IC.
- (2). Recognizing the functions of IC components, businesses must also create plans for investing in various IC components by judiciously allocating their constrained knowledge-based resources.
- (3). To support internal business operations, Indian industries should create a favorable corporate culture and implement the appropriate management control systems.
- (4). In order to improve the performance of technological innovation Indian industries should build networks. Managers should create plans to implement a variety of initiatives to strengthen their information technology skills.
- (5). Indian industries currently operate in order to develop a company's reputation and preserve customer loyalty they should maintain tight relationships with its suppliers and clients.
- (6). In order to secure long-term and sustainable development of the company, Indian enterprises should also maintain their scale of liabilities at a manageable level while financing intellectual property.

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