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Effect Of Intellectual Capital On The Performance Indicators Of Indian Metal Firms Listed In National Stock Exchange Of India Limited

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Abstract

This study examined the effect of intellectual capital imbedded in the metal companies in India. This paper used the secondary data gathered from Prowess database, between 2010 and 2019. Intellectual capital is measured by using Pulic's Value Added Intellectual Coefficient (VAIC) and its components. This paper found that there was positive correlation between IC and performance indicators of metal companies, particularly with ROA and ROE, except ATO while HCE, SCE, CEE and VAIC impacted the performance indicators positively. Future attempt could be made towards other manufacturing industries, by using this model.

Keywords: *Intellectual Capital, Metal Companies, Value Added Intellectual Coefficient and Manufacturing Industries*

Jel Code: 034, L25, L61, and N6

1. Introduction

Economists from around the world have been trying to find ways and imply to manage limited resources for over two centuries better. The traditional business strategy was based on the assumption of abundance, in which market forces will determine the market price. The knowledge, however, as a tool, is not based on the scarcity theory—higher knowledge supply, higher its value (Stevo Pucar, 2012). Bontis (2001) concluded that the cost of human capital is usually three times higher than the assets of company value. Effective and efficient human capital management is the only method to create a competitive advantage for companies (Baruch Lev, 2000). One of the critical factors needed to accelerate national economic growth is product development, especially in knowledge-intensive and technology-intensive industries (Murugesan Selvam et al . , 2018). Technology is becoming a priority action factor, and mass production, using technology, was based on premised cheap labor.

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As a result of advanced technology, knowledge-based companies are becoming increasingly important (Vishnu and Gupta, 2014). Skills and knowledge and human capital have become critical elements of competitiveness. In economic literature, the link between leadership capital and the team's management had also attracted substantial attention. Many previous researchers have analyzed, among many others, the marriage between human capital and organizational growth (Cavusgil and Zou 1994). However, this same marriage between academic wealth and financial productivity is still inadequately explored in India, especially throughout the metal industry. Its metric is the main issue in the area of intellectual capital. Unfortunately, the fact that it is intangible, irrespective of the concept's simplicity, has become a challenge for researchers when it becomes critical to calculating it, as it is difficult and costly correctly. In India, the steel sector is crucial. Hence this researchers analyzed investing in the principal value of metal sector intellectual capital. Therefore the study was to make a formula that identifies the intellectual capital, introduces the elements of such essential institutions, and defines the relationship between such factors and, third. This analysis would locate the influence of each of these factors on employee performance. This same goal of this report was to measure the impact of human capital throughout the metal industry, mentioned in NSE Sri Lanka limited, on the performance measures of firms. The paper's structure is as follows. The second part of the article works out the theoretical basis for this research after the intro. This is followed by the second-party study objectives and theories, and the seventh-part research methods and information. Results and analysis of results are shown in the fifth section, and maybe some time duration given is now at the end.

2. Review of Literature

Many businesses' survival depends upon their willingness and ability to manage change (Chrisman et al., 2015). Industries were able to remain competitive in the markets through adaptation of intellectual capital, according to tlbo et al. (2017). The root of the strategic edge has usually been intellectual capital due to innovation. Studies carried out by Morris (2011), Firer and Williams (2003) suggested that work capital or real wealth stayed the most valuable resource South African firms (Herremans et al., 2011). Information-based tools in the diverse and dynamic world economy have become a significant competitive advantage as awareness has enhanced the business's efficiency. Zéghal and Maaloul(2010) found IC to be the amount of knowledge that companies could use to build value throughout the research. Knowledge management is indeed a strategic asset because it positively affects business output (Merhi et al., 2013). Knowledge management should be used to enhance corporate performance and company reputation, as per Aivazian and Afanasiev (2011). The increased role of critical assets is a function of the knowledge and information economies. Research by 80 Taiwan tech companies (Huei- Jen Shi, 2006) showed that VAIC would have a positive impact on profitability (ROA) and trading price. Kujansivu (2009) found which intellectual capital was the least effective in forest-based firms, but the most effective in the use of their IC were the chemical industries. Kamath (2008) measured VAIC in India's pharmaceutical companies and found which Indian pharma firms used their intellectual capital well enough and efficiently. Basso et al. (2009) stated that the effect of human capital in technically more obtaining in Brazil was high, working on related models. Phusavat et al. (2011) examined the impact of the value-added intellectual coefficient (VAIC) on manufacturing companies' efficiency. The key competitive advantage or added value of firms was intellectual capital, as the capital stock was inherently predictable and expendable and could be easily accessed from the open market (bailey et al., 2006). Thanikachalam et al. (2019) explored a relation between both the human capital and the value of firms in the IT industries in Indonesia and noticed that information was concentrated.

3. Statement of the Problem

The transparency of intellectual Capital in developing markets such as India is at the initial level. In 2019, India surpassed China to be the world's second-largest steel producer, with 111.2 thousand tonnes of oil equivalent. In India, steel consumption is expected to grow by upwards of 7 percent as per the Indian Steel Organization (ISA), both in 2019-20 and 2020-21 (IBEF, 2020). The total R&D

(institutional Capital) expenditure allotted by 30 stocks was minimal, considering the Indonesian metal industry. The low R&D investment is due to reduced production rates and the performance of weak companies. The workforce is the heart of intellectual resources through which the industry survives or expands (Kamath, 2008). India 's mechanical industry has an employee tub, with high skills as educated labor. The country's population is increasing, and knowledge management is rising. The steelmakers are thought to be better to meet the nation's growing demands. Such factors represent the threshold for increasing costs for steel production and high production by firms. Few research has been published in India, covering earlier in this thread-mentioned topics, without tackling the complex problems. That research is to be carried out periodically. Under certain conditions, the authors of this study propose and investigate the effect of human Capital on the performance metrics of metal industries in Malaysia.

4. Need of the Study

The current study attempts to fill the research gap in research by examining the effect of human capital on metal firms' performance measures in India. The conclusions of this methodological study would become an eye-opener, especially for academics (academic level) and decision-makers (Government and Industry level), by demonstrating the non-existence of any analytical correlation among ingredients of intangible property and steel companies' output indicators in India. It will provide fresh perspectives into the future 's performance for the benefit of sample companies, try to measure the efficiency of human capital, and recommend insights into critical issues facing metal businesses..

5. Objective of the Study

The objective of this study was to assess the effect of VAIC and its components on performance indicators of sample companies

6. Hypotheses of the Study

a) There is no correlation between VAIC and performance indicators of sample companies.
b) There is no effect of VAIC on performance indicators of sample companies.

7. Methodology of the Study

7.1. Sample Selection

The aim of this paper was to investigate the impact of intellectual capital on the performance indicators of sample firms. Metal firms are knowledge based firms, which contribute much to the economic growth of India. Hence, it was proposed to cover all the 15 metal companies, listed in the National Stock Exchange of India Ltd, as on 31st, December, 2019.

7.2 Source of Data

For this research, the necessary samples were recorded from the verified and published financial statements of the sampled firms, as accessible at extremely skilled, retained by the Indian Economy control center. The other data required were obtained from test firm sites, papers published, Documents, and Articles.

7.3 Period of the Study

The present study covered a period of ten years from 01.01.2010 to 31.12.2019.

7.4 Tools used in this study

Descriptive analysis, Pearson Correlation, and Regression analysis were used to analyze the data. As stated earlier, VAIC i.e., the coefficient of exploitation of technical expertise in economic benefit development, is among the most used methods of calculating productive capacity. **(Pulic, 2001).**

Components of the model are: Output = Total income.

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Input = Total expenses (excluding staff costs and depreciation).
Value Added = Output-Input.....(1)
HC = staff costs, treated as investments.....(2)
CE = capital employed (both physical and financial capital).....(3)
SC = VA – HC (proxy for structural capital).....(4)
HCE = VA / HC (indicator of the efficiency of human capital).....(5)
CEE = VA / CE (indicator of the efficiency of capital employed).....(6)
SCE = SC / VA (structural indicator of the efficiency of capital).....(7)
VAIC =HCE + SCE + CEE (coefficient of use of intellectual capital in creating additional value).....(8)
ROA= Net Income/Total Assets.....(9)
ATO= Net Sales/Average Total Assets.....(10)
ROE=Net Income/Shareholders Equity.....(11)

8. Data Analysis

8.1 Descriptive Statistics for Intellectual Capital Performance Variables and Performance Indicators of Metal Companies

During the study period from 1 January 2010 to 31 December 2019, the results of Descriptive Statistics for sample companies' intellectual capital and performance indicators are given in Table-1. It must be noted that HCE, SCE, CEE, and VAIC were utilized as a dependent variable to measure the performance of the individual property. At the same time, ROA, ATO, and ROE were employed as a contingent variable to explain the nature of the test companies' fast results. The average scores reflected the quality of the set factors, and the value of standard variance implied the measure of variability from its average cost, about the performance variables of ownership concentration and performance management ratios. Measured values have helped in determining the number of scenarios evaluated and during the study period.

As per the results of an explanatory chart reported in Table-1, the principles of the internal control dependent variables moved inside the range of the average value of 0.018 (HCE), 0.005 (SCE), 0.007 (CEE), 0.018 (VAIC), 0.029 (ROA), 0.003 (ATO) and 0.048 (ROE), to the maximum values of 0.159 (HCE), 0.042 (SCE), 0.184 (CEE), 0.146 (VAIC), 0.201 (ROA), 0.131 (ATO) and 0.131 (ATO) and 0.131 (ATO); At the very same period, and during study period, mean values and standard deviations for HCE, SCE, CEE, VAIC, ROA, ATO, ROE were 0.061, 0.017, 0.052, 0.055, 0.078, 0.045, 0.092 and 0.043, 0.011, 0.057, 0.040, 0.057, 0.036, 0.051 respectively. It is known that the commodity companies generated more HCE prices, that recorded a price of 0.061than SCE (0.017) and CEE (0.052) values. The amount of total HCE, SCE, and CEE values, also called the coefficient of intellect, was more than the mean value of physical properties, i.e., CEE (0.052), signaling the fact that throughout the study the steel companies generated more values from unquantifiable VAIC modules than from financial and physical components. The cumulative ROE valuation was 0.092, revealing the highest beta score among the response variable, indicating that the steel firms earned enormous profits, accompanied by ROA, with such an average value of 0.078, were between. It should be remembered that ATO had the lowest mean score at 0.045, indicating that throughout the study, the metal companies encountered difficulties in generating maximum switch-over.

Table-1: Results for Descriptive Statistics for Intellectual Capital and Performance indicators of Metal Companies during the Study Period from 1st January 2010 to 31st December 2019

Variables	N	Minimum	Maximum	Mean	Std. Deviation
HCE	15	0.018	0.159	0.061	0.043

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SCE	15	0.005	0.042	0.017	0.011
CEE	15	0.007	0.184	0.052	0.057
VAIC	15	0.018	0.146	0.055	0.040
ROA	15	0.029	0.201	0.078	0.057
ATO	15	0.003	0.131	0.045	0.036
ROE	15	0.048	0.203	0.092	0.051

Source: Data extracted from CMIE ProwessIQ database and computed using IBM SPSS 16.0

8.2 Correlation between Intellectual Capital Performance and Performance Indicators of Metal Companies

Table-2 Exhibits similarity results obtained for survey companies' intangible value management practices and organizational performance during the study period from 1 January 2008 to 31 December 2018. As also reported, the VAIC, as well as its elements such as capital markets Efficiency (HCE) Structural operational efficiencies (SCE) and proposed transaction Efficiency (CEE), have been used as proxy variables for calculating human capital performance (independent variable). In contrast, Return of Assets (ROA), Asset Turnover Ratio (ATO), and Return on Equity (ROE) were used.

The results of the Pearson's correlation Matrix analysis showed that the correlation coefficients were 0.991 for SCE with HCE, 0.881 for CEE with HCE, 0.852 for CEE with SCE, 0.999 for VAIC with HCE, 0.988 for VAIC with SCE, 0.899 for VAIC with CEE, 0.987 for ROA with HCE, 0.989 for ROA with SCE, 0.987 for ROA with CEE, 0.987 for ROA with VAIC, 0.092 for ATO with HCE, 0.134 for A with HCE, 0.989 for ROA with C It is clear that 15 sets of variables (SCE-HCE, CEE-HCE, CEE-SCE, VAIC-HCE, VAIC-SCE, VAIC-CEE, ROA-HCE, ROA-SCE, ROA-CEE, ROA-VAIC, ROE-HCE, ROE-SCE, ROE-CEE, and ROE-VAIC practiced a good association at a level of confidence of 99 percent (i.e., p was less than 0.01). This should be remembered that throughout the study, factor sets such as ATO-HCE, ATO-SCE, ATO-CEE, ATO-VAIC, ATO-ROA, and ATO-ROE published a negative correlation at a level of confidence of 99 and 95 percent, respectively. Hence the null hypothesis (NH-1), specifically that there is no correlation among sample companies' human capital quality and performance metrics, was partially dismissed.

The ultimate results, as indicated in Table-2, revealed that when the rates of HCE, SCE, CEE, and VAIC had increased, the quality of ROA and ROE had correspondingly increased. In contrast, sample companies' ATO had declined during the study period. Intriguingly, VAIC has played a vital role in increasing the profitability of the sample companies after HCE. had exercised positive association with ROA and ROE, in the long run, during the study period.

Table-2: Results of Correlation Analysis between Intellectual Capital and Performance indicators of Metal Companies during the Study Period from 1st January 2010 to 31st December 2019

Variables		HCE	SCE	CEE	VAIC	ROA	ATO	ROE
HCE	Pearson Correlation	1						
	Sig. (2-tailed)							
SCE	Pearson Correlation	0.991***	1					
	Sig. (2-tailed)	0.000						

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CEE	Pearson Correlation	0.881***	0.852***	1				
	Sig. (2-tailed)	0.002	0.004					
VAIC	Pearson Correlation	0.999***	0.988***	0.899***	1			
	Sig. (2-tailed)	0.000	0.000	0.001				
ROA	Pearson Correlation	0.987***	0.989***	0.880***	0.987***	1		
	Sig. (2-tailed)	0.000	0.000	0.002	0.000	.		
ATO	Pearson Correlation	-0.092	-0.134	0.192	-0.068	-0.112	1	
	Sig. (2-tailed)	0.814	0.732	0.621	0.862	0.773		
ROE	Pearson Correlation	0.957***	0.979***	0.825***	0.954***	0.972***	-0.240	1
	Sig. (2-tailed)	0.000	0.000	0.006	0.000	0.000	0.535	
	N	15	15	15	15	15	15	15

Source: Data extracted from CMIE ProwessIQ database and computed using IBM SPSS 16.0
Note: * indicates statistically significant.

8.3. Impact of Intellectual Capital Performance on Performance Indicators of Metal Companies

The results of regression analysis, for intellectual capital performance and firm performance of the sample companies during the study period from 1st January 2010 to 31st December 2019, are given in **Table-3.** It is to be noted that variables such as HCE, SCE, CEE, and VAIC were used as independent variables, for measuring intellectual capital performance while ROA, ATO and ROE were used as dependent variables, to understand the financial performance of sample companies.

Table-3 displays the values of coefficient for ROA, were at 0.943, 0.958, 0.941, and 0.944, for HCE, SCE, CEE and VAIC in respect of sample companies. Further, the results of coefficient indicated that the values of t-statistic and probability were at 7.506 (0.000), 8.855 (0.000), 7.563 (0.000) and 7.592 (0.000), during the study period. The coefficient values of 0.890, 0.941, 0.888 and 0.894 were recorded by HCE, SCE, CEE and VAIC respectively, in terms of ROE with the t-statistic and probability values of 5.152 (0.001), 7.351 (0.000), 5.102 (0.001) and 5.289 (0.001). But variables such as HCE, SCE, CEE and VAIC recorded the coefficient values, at -0.101, -0.192, -0.033 and -0.104, in respect of ATO, during the study period.

The effect of quality of technical expertise on ROA and ROE was significant, of trust rates of 99 percent. In contrast, during the period of study, HCE witnessed a negative effect on ATO, SCE on ATO, and CEE on ATO and VAIC on ATO. It is clear that HCE, a human capital substitute, has played a crucial role in making the listed firms profitable. This should be remembered in which Modified R-squared quality was used to evaluate the correlation system 's fitness, with both the ROA value of 0.906 and ROE value of 0.869. The regression analysis was a form made for analyzing the effect of productive capacity on the organizational value of sampled firms, except for ATO. The outcomes, as seen in Table-3, clearly showed that perhaps the intellectual capital model approach created a significant impact on the selected firms' performance measures. Hence the null hypothesis (NH-2), **there is no effect of intellectual capital performance on performance indicators of sample companies,** was partially rejected.

Table-3: Impact of Intellectual Capital on Performance indicators of Metal Companies during the Study Period from 1st January 2010 to 31st December 2019

Variables	ROA	ATO	ROE
Constant	0.010*** - (3.016)	0.035 - (2.599)	0.004*** - (4.288)
HCE	0.000** 0.943 (7.506)	0.796 -0.101 (-0.268)	0.001*** 0.890 (5.152)
SCE	0.000** 0.958 (8.855)	0.620 -0.192 (-0.518)	0.000*** 0.941 (7.351)
CEE	0.000*** 0.941 (7.563)	0.933 -0.033 (-0.088)	0.001*** 0.888 (5.102)
VAIC	0.000*** 0.944 (7.592)	0.790 -0.104 (-0.277)	0.001*** 0.894 (5.289)
Adjust R^2	0.906	-0.101	0.869
N	15	15	15

Source: Data extracted from CMIE ProwessIQ database and computed using IBM SPSS 16.0
Note: * indicates statistically significant.

9. Conclusion and Recommendation

The aim of this study was to examine the effect of the intellectual capital on the performance indicators of the select metal companies, listed in NSE India limited. It was found that the ROE had recorded the highest mean value, among the dependent variables, indicating that the metal companies earned huge profits. In contrast, ATO had reported the lowest mean value, demonstrating that the metal companies faced difficulties in generating optimum turn over. It is interesting to note that all the components of intellectual capital were associated with performance indicators, except asset turnover. Thus the VAIC played a vital role in the increase of profitability of the sample companies. It is found from the regression analysis thatROA and ROE were heavily influenced by the components of VAIC and the regression model had perfectly fitted. The results of this study have clearly provided, necessary inputs for the corporate executives, belonging to metal companies. They should focus on managing assets effectively and pay the attention to employ the knowledge of the workers as much as possible. In this connection, government officials and other policy makers are requested to incorporate an Experts Committee, to guide the companies towards utilizing the human capital. Managers of organization must get better understand the mentality and the concept of intellectual capital better **(Salehi, et al., 2014).** This study concentrated only on 15 companies operating in India, with the secondary data. Studies in future may analyze more number of companies, for better understanding of the intellectual capital.

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