

**COMPONENTS OF INTELLECTUAL CAPITAL AND SHAREHOLDERS' RETURN: A COMPARATIVE STUDY**

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**ABSTRACT**

Shareholders are the key stakeholders of a company who provides necessary finances to the company operations with the expectation of earning high return on their investments and who makes their investment decisions based on the financial statement of the company. But the book value of equity and the market value of equity are not tally in the financial statements of the companies representing a hidden value which badly affects to the shareholders' decisions incorrectly and which almost affected by the intellectual capital of the companies. So, the objective of this comparative study is to identify the impact of intellectual capital and its components on shareholders' return in the companies of manufacturing sector and service sector in Sri Lankan context.

The study was executed based on 52 Public Listed Companies (PLCs) in manufacturing sector and service sector in Colombo Stock Exchange (CSE) and the annual reports of the companies from accounting year 2005 to 2009 were utilized to collect the relevant data. Value Added Intellectual Coefficient (VAIC<sup>TM</sup>) and its three components, Capital Employed Efficiency (VACA), Human Capital Efficiency (VAHU) and Structural Capital Efficiency (STVA) developed by Ante Public (1998) were used to measure the intellectual capital efficiency, while Return on Equity (ROE) measured the shareholders' return of the selected companies.

The findings revealed that, no significant positive impact of intellectual capital on return on equity in both sectors and this was consistent with prior studies done by Najibullah (2005). There was a significant positive impact of capital employed efficiency on return on equity in manufacturing sector, but it was not in service sector. Findings further revealed a significant positive impact of human capital efficiency on return on equity in service sector, but not in manufacturing sector. The impact of structural capital efficiency on return on equity was not significant positive in both sectors. So, it can be concluded that, though there is no significant impact of intellectual capital on shareholders' return, positive impact between them can be observed and some components of intellectual capital have significant positive impact on shareholders' return confirming that shareholders' return is affected by the intellectual capital of the companies.

**Key words:** Intellectual Capital, Value Added Intellectual Coefficient, Capital Employed Efficiency, Human Capital Efficiency, Structural Capital Efficiency, Return on Equity

## **1. INTRODUCTION**

Shareholders are the key stakeholders of a company who provides necessary finances to the company operations with the expectation of earning high return on their investments. So, they are always concentrating on the financial performance of the company and the company's financial statements are the only way of providing such financial performance information to shareholders. Shareholders are taking their most important investment decisions, such as sell, buy or retain shares, based on the financial statements of the companies. But these financial statements do not reflect the real value creation through company's business process as the book value of equity presented in financial statements is not agreed with the value of equity created in the stock market. Thus it can be seen a hidden value of the companies, which affects to shareholders decision making defectively.

Abeysekara (2008) reported that, the paradigm shift from focusing on tangible assets to non-tangible assets not recognized in financial statements to increase competitiveness of firms has challenged the decision relevance of information provided by financial reporting system. In particular, it is pointed out several assets that enable firms to enhance competitiveness and future profitability are not recognized in financial statements such as knowledge assets represented by employees' collective capabilities, information systems in firms are relevant information for investor decision making. In addition to that, the use of traditional performance measurement techniques may lead investors and other stakeholders to make inappropriate decisions when companies have a large proportion of their investment in intangible assets (Firer and Williams, 2003).

The great gaps between market value of the company and its book value have successfully drawn the researchers' attention to study and investigate the missing value which has not been reported in the financial reports (Daniel and De Jonge). Consequently, Intellectual Capital has been recognized as the most important strategic asset which affects to the hidden value in the companies' financial statements. According to Edvinson and Malone (1997), intellectual capital is the difference between firm's market value and book value.

The objective of this comparative study is to explore the relationship between intellectual capital and shareholders' return. Exploring such relationship is important as shareholders are expecting high return on their investments and their investment decisions are based on the financial statements of companies which consist with the hidden value that almost represented by intellectual capital.

It can be seen a lack of research studies done on the theme of intellectual capital in Sri Lanka. So, this paper contributes to the intellectual capital literature in Sri Lanka in several ways: First, it attempts to investigate the impact of intellectual capital and its components on companies' shareholders' return; second, it finds whether the said relationship is varied in sector wise company analysis; third, it aims to justify the importance of disclosing intellectual capital information on the financial statements of the companies

## **2. LITERATURE REVIEW**

### **2.1 Intellectual Capital and Its Components**

The Intellectual Capital becomes the key feature in the knowledge era endow with the business world's success and it now is recognized as the most valuable asset in the modern-day businesses which pilots to the sustainable competitive advantages. What is intellectual capital? Until now, the definition has been elusive. But in recent years, driven by necessity, individuals and groups in diverse disciplines have begun to tackle the challenge of finding a standardized explanation (Edvinsson and Malone, 1997).

Intellectual capital can be defined as something which already exists in a firm but cannot be seen on its balance sheet exactly, a competitive advantage over the firm's competitors, future values and includes all its intangible assets, the value of knowledge, information, intellectual property and experience, a key factor influencing the future value of the firm (Yalama and Coskun, 2007). Stewart (1999) defines intellectual capital as "knowledge, information, intellectual property and experience that can be put to use to create wealth".

Stewart (1999) states that intellectual capital should be found in three places in an organization: it people, its structures and its customers. He further emphasizes that Hurbert Saint-Onge of the Canadian Imperial Bank of Commerce and Leif Edvinsson of Scandia divide intellectual capital into three parts: human capital, structural capital and customer capital.

Ghosh and Mondal (2009) identify the three components of intellectual capital as human capital, structural capital and relational capital. Human capital is recognized as the largest and the most important intangible asset in an organization. Ultimately it provides the goods or services that customers require or the solutions to their problems. It includes the collective knowledge, competency, experience, skills and talents of people within an organization. It also includes an organization's creative capacity and its ability to be innovative. Although investment in human capital is growing, there is no standard measure of its effectiveness in companies' balance sheets. Structural capital is the supportive infrastructure for human capital- it is the capital, which remains in the factory or office when the employees leave at the end of the day. It includes organizational ability, processes, data and patents. Unlike human capital, it is the property of the firm, which can be traded, reproduced and shared by and within the organization. Relational capital is a company's relationship with its customers and with its network of suppliers, strategic partners and shareholders (Ghosh and Mondal, 2009).

### **2.2 Shareholders' Return**

Shareholders' return can be measured either by Earnings per Share (EPS) or by Return on Equity (ROE). Common or ordinary shareholders are entitled to the residual profits. The rate of dividend is not fixed; the earnings may be distributed to shareholders or retained in the business. Nevertheless, the net profits after taxes

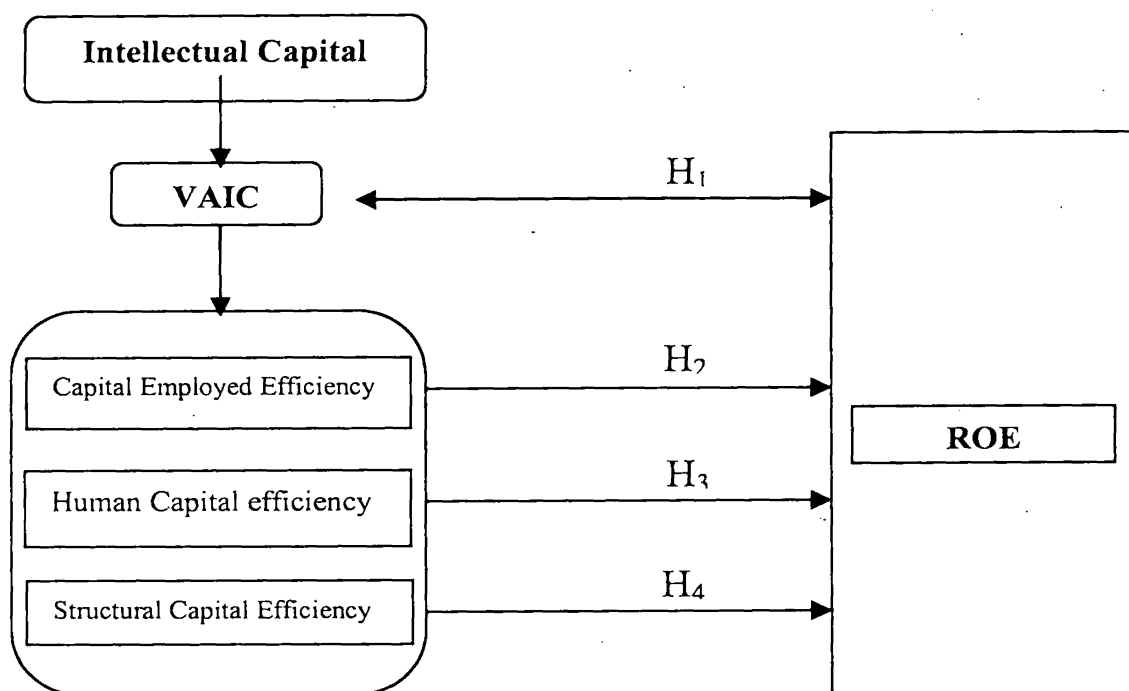
represent their return. A return on shareholders' equity is calculated to see the profitability of owners' investment (Panday I.M., 2006).

### 3. METHODOLOGY

The study was carried out based on the annual reports during the period of accounting year 2005 to 2009 of 52 public listed companies (PLCs) in manufacturing sector and service sector in Colombo Stock Exchange (CSE).

#### 3.1 Conceptualization

Conceptual framework of this study is as follows;



**Figure 1 Conceptual Framework**

Accordingly following hypotheses were developed;

- H<sub>1</sub> There is a positive relationship between companies' intellectual capital and return on equity, ceteris paribus.
- H<sub>2</sub> There is a positive relationship between companies' physical capital efficiency and return on equity, ceteris paribus.
- H<sub>3</sub> There is a positive relationship between companies' human capital efficiency and return on equity, ceteris paribus.
- H<sub>4</sub> There is a positive relationship between companies' structural capital in the creation of value added and return on equity, ceteris paribus.

## 3.2 Operationalization of the Variables

### 3.2.1 Dependent Variable

$$\text{Return on Ordinary Shareholders' Equity (ROE)} \\ = \frac{\text{Net Profit (after tax)} - \text{Preference Dividends}}{\text{Average Ordinary Shareholders Equity}}$$

### 3.2.2 Independent Variables

Value Added Intellectual Coefficient (VAIC) is the independent variable in this model. VAIC is calculated as follows according to Chen *et al.* (2005);

VA = Value added

CE = Book value of the net assets

HU = Total expenditure on employees

SC = VA – HU

VACA (Indicator of value added efficiency of capital employed) = VA ÷ CE

VAHU (Indicator of value added efficiency of human capital) = VA ÷ HU

STVA (Indicator of value added efficiency of structural capital) = SC ÷ VA

$$\text{VAIC} = \text{VACA} + \text{VAHU} + \text{STVA}^1$$

## 3.3 Data Analysis Tools

Data was analyzed using correlation and regression techniques in Business Statistics. For the purpose of analyzing the data the Statistical Package for Social Sciences (SPSS) version 17.0 was used.

### 3.3.1 Regression Models

$$\text{ROE}_{it} = \beta_0 + \beta_1 \text{VAIC}_{it} \quad (1)$$

$$\text{ROE}_{it} = \beta_0 + \beta_1 \text{VACA}_{it} + \beta_2 \text{VAHU}_{it} + \beta_3 \text{STVA}_{it} \quad (2)$$

Model 1 examines the dependence of ROE on overall intellectual capital measure, i.e. VAIC. Model 2 is used to examine the dependence of ROE on physical capital efficiency, human capital efficiency and structural capital in the creation of value added.

## 4. FINDINGS

### 4.1 Descriptive Statistics

The mean value of ROE of the PLCs in the manufacturing sector (ROE = 16.05%) corresponds to generally good ROE as compared with the average ROE of the PLCs in service sector (ROE = 0.78%) in Sri Lanka. When the average value added efficiencies are concerned in the manufacturing sector PLCs (VACA = 0.89, VAHU = 13.30, and STVA = 0.33), the contribution of the human capital in the value addition is higher than the capital employed and structural capital. The average value added efficiencies of the PLCs in the service sector (VACA = 0.27, VAHU =

<sup>1</sup> Chen *et al.* (2005)

6.59, and STVA = 0.62) too implies that value added efficiency of human capital is much substantial than capital employed and structural capital. Further, the average VAIC (VAIC = 14.51) in manufacturing sector is higher than the average VAIC (VAIC = 7.49) in service sector.

The comparison between two sectors can be presented as follows;

**Table 1 Sector Comparison Based on Descriptive Statistics**

Variable	Comparison
Return on Equity	High ROE in manufacturing sector than service sector can be observed
Capital Employed Efficiency	Higher value in manufacturing sector can be observed than in service sector.
Human Capital Efficiency	It can be observed higher value, almost 50% in the manufacturing sector than in service sector.
Structural Capital Efficiency	A high value can be examined in the service sector with compared to manufacturing sector.
Value Added Intellectual Coefficient	The intellectual capital coefficient appears to be high in the manufacturing sector than in service sector

#### 4.2 Correlation Analysis

**Table 2 Correlation Matrix of the Variables in Manufacturing Sector**

	ROE	VACA	VAHU	STVA	VAIC
ROE	1	.933**	-.012	.149	.067
VACA		1	.013	.117	.097
VAHU			1	.053	.996**
STVA				1	.078
VAIC					1

\*\* . Correlation is significant at the 0.01 level (2-tailed).  
 \* . Correlation is significant at the 0.05 level (2-tailed).

In manufacturing sector, the correlation between ROE and VACA ( $r = .933$ ,  $p < 0.01$ ) points out a significant positive correlation, while the correlation coefficients of VAIC and STVA with ROE show an insignificant positive relationship. An insignificant negative relationship between ROE and VAHU can be observed from the findings in manufacturing sector. It can be observed a significant negative relationship between ROE and VACA ( $r = -.183$ ,  $p < 0.05$ ) and an insignificant negative correlation between ROE and STVA in service sector. In addition, the correlation findings indicate that, there is an insignificant positive correlation of VAHU and VAIC with ROE in service sector.

**Table 3 Correlation Matrix of the Variables in Service Sector**

	ROE	VACA	VAHU	STVA	VAIC
ROE	1	-.183*	.158	-.068	.150
VACA		1	.149	.128	.171
VAHU			1	.222*	.999**
STVA				1	.259**
VAIC					1

\*\* . Correlation is significant at the 0.01 level (2-tailed).  
 \* . Correlation is significant at the 0.05 level (2-tailed).

Sector comparison based on correlation analysis can be seen in following table;

**Table 4 Sector Comparison Based on Correlation Analysis**

Correlation	Manufacturing sector	Service sector	Remarks
ROE and VAIC	Insignificant, positive	Insignificant, positive	The similar results of correlation can be seen in both sectors showing positive, but not significant relationships. So, it does not support enough to prove the hypothesis 1.
ROE and VACA	Significant, positive	Significant, negative	The different results of correlation can be identified for two sectors. The hypothesis 2 can be proved in manufacturing sector, but not in service sector.
ROE and VAHU	Insignificant, negative	Significant, positive	It can be observed the diverse results for two sectors. The hypothesis 3 can be accepted only for service sector.
ROE and STVA	Insignificant, positive	Insignificant, negative	Different results can be found for two sectors. As the positive relationship in manufacturing sector is not a significant one, hypothesis 4 cannot be proved.

### 4.3 Regression Analysis

#### 4.3.1 Tests of Normality

The Shapiro-Wilk test and normal Q-Q plot were used to test the normal distribution of dependent variable, i.e. ROE. Table 5 and Table 6 illustrate the output of Shapiro-Wilk Test of Normality for manufacturing sector and service sector respectively.

**Table 5 Shapiro-Wilk Test of Normality for Manufacturing Sector**

Variables	Shapiro-Wilk		
	Statistic	df	Sig.
Return on Equity	.987	135	.581

Source: Compiled from SPSS output

The null hypothesis for this test is that the data are normally distributed. The Prob < W value listed in the output is the p-value. If the chosen alpha level is 0.05 and the p-value is less than 0.05, then the null hypothesis that the data are normally distributed is rejected. If the p-value is greater than 0.05, then the null hypothesis

has not been rejected (<http://www.jmp.com/support/faq/jmp2085.shtml>). It can be observed that the significance of Shapiro-Wilk test for the dependent variable in the manufacturing is greater than to 0.05. Therefore, it seems that all data are normally distributed and hence the regression analysis can be applied to analyze the data to test the hypotheses.

**Table 6 Shapiro-Wilk Test of Normality for Service Sector**

Variables	Shapiro-Wilk		
	Statistic	df	Sig.
Return on Equity	.966	125	.051

Source: Compiled from SPSS output

The significance of the dependent variable in the service sector lies on the values greater than 0.05. It implies that the dependent variable is normally distributed and thus the regression analysis can be used to test the hypotheses.

#### 4.3.2 Sector-wise Analysis

Table 7 and 8 illustrate the simple linear regression model on ROE for manufacturing sector and service sector respectively.

**Table 7 Simple Linear Regression Model on ROE in Manufacturing Sector**

Model		B	Standard Error	$\beta$	t	Sig.	R <sup>2</sup>	Durbin-Watson
1	(Constant)	121.002	119.891		1.009	.315	.005	2.016
	VAIC	.943	1.215	.067	.776	.439		
a. Predictors: (Constant), Value Added Intellectual Coefficient								
b. Dependent Variable: Return on Equity								

Source: Compiled from SPSS output

The results of regression analysis in manufacturing sector reveal that, there is an increase of 0.943 in ROE as a result of increase of every one unit of VAIC. Further the explanatory power of VAIC on ROE is 0.5%, which very much insignificant.

**Table 8 Simple Linear Regression Model on ROE in Service Sector**

Model		B	Standard Error	$\beta$	t	Sig.	R <sup>2</sup>	Durbin-Watson
1	(Constant)	-.464	1.532		-.303	.762	.023	1.941
	VAIC	.166	.098	.150	1.686	.094		
a. Predictors: (Constant), Value Added Intellectual Coefficient								
b. Dependent Variable: Return on Equity								

Source: Compiled from SPSS output

The regression analysis on ROE in service sector indicates that, there is a 2.3% explanatory power in VAIC explaining the variability of ROE. In addition, for every one unit increase in VAIC, there is a corresponding increase in 0.166 of ROE.

Multiple linear regression analysis on ROE is shown in Table 9 for manufacturing



sector and in Table 10 for service sector.

**Table 9 Multiple Linear Regression Model on ROE in Manufacturing Sector**

Model		B	Standard Error	$\beta$	t	Sig.	R <sup>2</sup>	Durbin-Watson
1	(Constant)	-13.142	44.144		-.298	.766	.873	1.994
	Capital Employed Efficiency	158.460	5.356	.929	29.587	.000		
	Human Capital Efficiency	-.373	.441	-.026	-.847	.399		
	Structural capital Efficiency	36.414	27.862	.041	1.307	.194		
a. Predictors: (Constant), Structural capital Efficiency, Capital Employed Efficiency, Human Capital Efficiency								
b. Dependent Variable: Return on Equity								

Source: Compiled from SPSS output

For every one unit increase in VACA, there is a corresponding increase in ROE of 158.460, implying a positive impact in manufacturing sector. There is a decrease of 0.373 units of ROE resultant to every one unit increase in VAHU, indicating a negative impact between VAHU and ROE. It can be further examined from the regression results that, for every one unit increase in STVA, there is a corresponding increase in ROE of 36.414 in manufacturing sector.

**Table 10 Multiple Linear Regression Model on ROE in Service Sector**

Model		B	Standard Error	$\beta$	t	Sig.	R <sup>2</sup>	Durbin-Watson
1	(Constant)	4.012	2.395		1.675	.096	.076	2.007
	Capital Employed Efficiency	-11.534	5.043	-.203	-2.287	.024		
	Human Capital Efficiency	.232	.101	.208	2.302	.023		
	Structural capital Efficiency	-2.649	2.711	-.088	-.977	.330		
a. Predictors: (Constant), Structural capital Efficiency, Capital Employed Efficiency, Human Capital Efficiency								
b. Dependent Variable: Return on Equity								

Source: Compiled from SPSS output

There is a decrease of ROE by 11.534 as a result of every one unit increase in VACA representing a negative impact in service sector. The results points out that, for every one unit increase of VAHU, there is a corresponding increase in ROE of 0.232 indicating a positive impact of VAHU on ROE. The impact of STVA on ROE shows a negative one, representing a corresponding decrease in ROE of 2.649 for every one unit increase in STVA.

### 4.3.3 Sector Comparison

There was a significant positive impact of physical capital efficiency on return on equity in manufacturing sector, but it was not in service sector. Findings further revealed a significant positive impact of human capital efficiency on return on equity in service sector, but not in manufacturing sector. The impact of structural capital efficiency on return on equity was not significant positive in both sectors. Further, the components of intellectual capital can explain greater variability in return on equity in manufacturing sector ( $R^2=87.3\%$ ) and in service sector it was only 7.6%. A summary of hypotheses testing is presented in following table.

**Table 11 The Summary of Hypotheses Testing**

Hypotheses	Hypothesis supported: yes/no		Model
	Manufacturing sector	Service sector	
H1	No	No	1
H2	Yes	No	2
H3	No	Yes	2
H4	No	No	2

It can be observed that only one hypothesis was accepted in each sector.

## 5 CONCLUSIONS AND RECOMMENDATIONS

The intellectual capital was a good indicator of increasing return on equity showing a considerable explanatory power in service sector. It implied that, the service sector PLCs with high intellectual capital efficiency can experience high return on equity. In other words, investors can enjoy with high returns on their investments from the PLCs which have high efficiency of intellectual capital. Whereas the PLCs in manufacturing sector in Sri Lanka also showed a positive impact between intellectual capital efficiency and ROE, but it was not significant. Anyway it could be concluded that, intellectual capital plays a considerable role in enhancing ROE in manufacturing sector too.

Sri Lankan PLCs in manufacturing sector still consider the physical capital efficiency in enhancing return on equity. So, in manufacturing sector companies' investors can enjoy with high return where there is high efficiency in physical capital. But in the service sector's situation is diverse from manufacturing. The investors in service sector PLCs in Sri Lanka can earn high return from the companies with high human capital efficiency. Still the structural capital efficiency is unable to contribute to enhance the return on equity in both sectors in Sri Lanka.

Therefore, if the accounting regulatory bodies in Sri Lanka can provide the necessary disclosure requirements of intellectual capital on financial statements of the listed public companies in Sri Lanka, the investors can gain a good understanding on the concept of intellectual capital. Then they tend to concentrate on intellectual capital too when they make their investment decisions in companies' securities. And also, it is important to hire a leader responsible for the intellectual capital development by the companies as it plays a considerable role in enhancing the investors' return and the concept of intellectual capital will be a good indicator when deciding the investors' return in the future.

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