



Asian Research Consortium

Asian Journal of Research in Business Economics and Management
Vol. 7, No. 8, August 2017, pp. 357-369.

ISSN 2249-7307

A Journal Indexed in Indian Citation Index

DOI NUMBER:

UGC APPROVED JOURNAL

**Asian Journal
of Research in
Business Economics
and
Management**

www.aijsh.com

Examining the Effect of Intellectual Capital Efficiency on Financial Performance in Indian Real Estate Industry

Dr. Raman Deep Singh*; Dr. Vinod Kumar**

*Assistant Professor,

Department of Commerce,

Sri Venkateswara College,

University of Delhi,

Delhi, India.

ramandeepjrf@gmail.com

**Assistant Professor,

Department of Commerce,

Sri Venkateswara College,

University of Delhi,

Delhi, India.

drvinodtoor@gmail.com

Abstract

The present study examines the effect of intellectual capital efficiency on profitability and market valuation in Indian real estate industry for a period of 10 years from 2006 to 2015 respectively. The Value Added Intellectual Coefficient (VAICTM) model has been employed for measuring the intellectual capital efficiency of the companies. For analyzing the relationship between the variables, correlation and panel regression has been used in the study. The results show that intellectual capital in real estate industry has a significant impact on profitability, but not on the market valuation of the companies. The study also evinced that human capital is found to have a significant relationship only with profitability; whereas structural capital, an important element of intellectual capital, is not having any significant contribution in increasing the financial performance of the companies. The results further revealed that physical capital is highly regarded in improving the profitability and market valuation of the companies. The finding clearly indicates that Indian investors at the time of investment decision give more importance to the financial disclosure of the companies.

Keywords: Intellectual capital, Human Capital Efficiency, Structural Capital Efficiency, Capital Employed Efficiency, Real Estate Industry, Profitability, Market valuation.

1. Introduction

The world is being rapidly replaced from industrial economy, where employment of financial resources were having main contribution in the economic growth, towards knowledge based, technological economy, where intangible assets are considered to be the main determinant of wealth creation. The main drivers of value creation are now mainly of intangible nature. The gap between book value and market value of firms in the stock market, which is often referred to as hidden value is because of intellectual capital (hereafter IC). Although, the expanding disparities cannot be attributed entirely to IC, it takes the biggest proportion for the hidden value. Knowledge has become the key economic resource and the dominant and perhaps even the only source of competitive advantage (Usoff et al. 2002). Companies gain competitive advantage and superior financial performance through the acquisition, holding and efficient use of strategic resources. Firms, by means of efficient utilization of its intellectual capital can outperform other companies.

1.2 Intellectual Capital

According to various scholars, IC is considered to be the hidden value that escapes financial statements and the one that leads organizations to obtain a competitive advantage (Chen et al., 2005; Edvinsson and Malone, 1997; Lev and Radhakrishnan, 2003; Lev and Zarowin, 1999; Lev, 2001; Yang and Lin, 2009). IC is the difference between a company's market value and its book value. There are various definitions of IC and most definitions submit that IC is a non-monetary asset which is without physical substance possessing value and can generate future benefits for the organization. Stewart (1997) defined IC as "packaged useful knowledge". The Swedish firm Skandia defined IC as "the possession of knowledge, applied experience, organizational technology, customer relationships, and professional skills" (Edvinsson, 1997, p. 368). According to Sullivan (2000) intellectual capital could be defined as knowledge that can be converted into profit.

1.2.1 Classification of Intellectual Capital

Edvinsson and Malone (1997), Bontis (1998) and Sullivan (1998) have adopted the three group categorizations for IC classification termed as:

1.2.1.1 Human Capital

Human capital is seen as the foundation of an organization as in the current environment success relies on the individual's knowledge, ideas, skill and talent. Human capital is the knowledge that employees take with them when they leave the organization (Baker, 2008). It includes the knowledge, skills, experiences and abilities of people (Ricceri, 2008). Human capital can be defined as knowledge that an individual possess and through which he makes his contribution in the organization.

1.2.1.2 Structural Capital

Structural capital, also known as organizational capital is the backbone of the organization (Burr & Girardi, 2002). Structural capital is formed by the intellectual efforts of the employees and belongs to the organization. Structural capital is the corroborative infrastructure for the human capital (Chan, 2009a). Martinez-Torres (2006) defined structural capital as the belonging of the organization, such as database, organization culture, strategies, processes, working systems and information.

1.2.1.3 Relational Capital

Relational capital refers to external relations of an organization with other organizations, customers and suppliers. Few examples of relational capital are reputations, image, branding, customer loyalty and satisfaction, commercial power and environmental activities of the firm. Relational capital is the ability of an organization to create relational value with its external stakeholders.

2. Review of Literature

In recent years, many firms have started measuring and reporting their intangible assets. However, voluntary IC disclosure is still in its infancy stage. In the last decade, many researchers have adopted VAICTM methodology for their research on measuring IC efficiency and its relationship with financial performance. (Firer and Williams, 2003; Mavridis, 2005; Chen et al., 2005; Tan et al., 2007; Chan, 2009a, 2009b; Ghosh and Mondal, 2009; Calisir et al., 2010; Zeghal and Maaloul, 2010; Sharabati et al., 2010; Ahangar, 2011; Clarke et al., 2011; Komnenic and Pokrajcic, 2012). Deep and Narwal (2014) examined the IC performance by taking 100 textile companies of India. The IC is found to have a significant relationship only with profitability of the companies. The association of IC with productivity and market valuation of the firm is found to be non-significant. The authors concluded that the Indian textile sector still emphasize more on Physical assets rather than intellectual capital. A brief description of relevant studies is presented here to provide a glance on the existing literature. Baye et al. (2014) took a sample of 60 Cameroon companies and found that only physical capital has a significant impact on profitability of financial institutions. The study also analyzed that human and structural capital is not playing any significant role in increasing the profitability. The authors concluded that a better understanding of measurement and management of IC efficiency would result in greater profitability for the financial institutions. Mehralian et al. (2012) carried out a study on pharmaceutical industry of Iran to find out any relationship between IC components with financial performance. The study found that IC of the company can explain profitability but not productivity and market valuation in Iran. Komnenic and Pokrajcic (2012) investigated if IC has an impact on organizational performance of MNCs in Serbia. The study concluded that human capital is positively associated with all three corporate performance measures. Khanquah et al. (2012) took 28 Iranian firms and found that IC is having no impact on market value and financial performance of the company. It was found that structure capital has a significant relationship with financial performance measures (ROE, ROA) respectively. The study concluded that the development of structural resources seems to be one of the most significant factors of economic success. Pal and Soriya (2011) studied association of IC with company performance in Indian IT Industry. It is found that IC efficiency plays a significant role in increasing the profitability of the company. Rehman et al. (2011) carried out a study on Modaraba

sector in Pakistan to analyze the impact of intellectual capital on the corporate performance of the companies. The authors concluded that human capital and structural capital is having a significant association with return on equity (ROE) and earnings per share (EPS) respectively. Ahangar (2011) analyzed the association of IC with financial performance components in Iranian companies. The study found that human capital is significantly associated with financial performance of the companies. Ghosh and Mondal (2009) analyzed 80 Indian pharmaceutical and software companies and found a positive relationship between IC and profitability. The relationship of IC efficiency with productivity and market to book value ratio is found to be non-significant. The authors came up with the finding that Indian investors are not influenced by IC performance of the companies. Tan et al. (2007) analyzed the association between intellectual capital and financial performance in Singapore. The study found that intellectual capital performance is positively associated with performance of the companies.

2.2 Hypotheses Development

The objective of the present study is to measure the intellectual capital efficiency in Indian real estate industry and to find out its association with profitability and market valuation. For the stated purpose, following hypotheses have been formulated:

H₀₁: VAIC has a significant effect on profitability of Indian real estate companies.

H₀₂: VAIC has a significant effect on market valuation of Indian real estate companies.

H₀₃: Human capital efficiency (HCE) has a significant effect on profitability of Indian real estate companies.

H₀₄: Human capital efficiency (HCE) has a significant effect on market valuation of Indian real estate companies.

H₀₅: Structural capital efficiency (SCE) has a significant effect on profitability of Indian real estate companies.

H₀₆: Structural capital efficiency (SCE) has a significant effect on market valuation of Indian real estate companies.

H₀₇: Capital Employed efficiency (CEE) has a significant effect on profitability of Indian real estate companies.

H₀₈: Capital Employed efficiency (CEE) has a significant effect on market valuation of Indian real estate companies.

3. Research Methodology

3.1 Sample Size and Database of the Study

For carry out the analysis in the present study, VAIC constructs has been used for the measurement of intellectual capital and as independent variables. It is a composite of three indicators such as human capital efficiency, structural capital efficiency and capital employed efficiency respectively.

Two traditional measures i.e., return on asset (ROA) and market valuation (MB) has been employed as dependent variables. Two control variables i.e. debt equity ratio (DER) and SIZE has been used in the study to control their effect on dependent variables. The top 50 companies of Indian real estate industry have been chosen for the study. The data has been collected from CMIE Prowess database for a period of 10 years i.e. from 2005-06 to 2014-15. The selected companies are listed on both NSE and BSE. Panel regressions have been applied to check the effect of IC on the financial performance.

3.2 Definition of Variables

3.2.1 Independent Variables

For the study, VAICTM method developed by Ante Pulic (1998, 2000a) has been employed to measures the efficiency of intellectual capital and as independent variable in the study. For measuring the intellectual capital efficiency of the company, first of all value added is measured as

$$VA = W + I + T + NI \dots \dots \dots (1)$$

Where, W = Wages and salaries;

I = Interest expenses;

T = Taxes paid and

NI = Profit after tax.

In the second step, human capital efficiency (HCE) is computed as the ratio of value added (VA) divided by the total salary and wages of the firm. In the VAICTM model, total expenses on the employees are not taken as a cost for the company but as an investment in the value creation. In the model, wages and salaries of the employees are considered as the human capital. HCE is calculated as:

$$HCE = VA / HC$$

Where,

HCE = Human capital efficiency,

VA = Value added of the firm

HC = Human capital,

In the third step, structural capital efficiency is calculated. It determines the efficiency of structural capital in the value creation. To compute the value of SCE, the value of structural capital is determined. Structural capital is obtained by deducting human capital from the value added.

$$SC = VA - HC$$

Where,

SC = Structural capital,

VA = Value added,

HC = Wages and salary

Structural capital is in reverse proportion with human capital i.e. more the contribution of human capital in value added, lesser would be the portion of structural capital.

Having computing the SC, the calculation of SCE is as:

$$SCE = SC/VA$$

Where,

SCE = Structural capital efficiency,

VA = Value added,

SC = Structural capital

In the next step, capital employed efficiency (CEE) of the firm is calculated. In a company intellectual capital can't function on its own and needs to operate with physical capital. Capital employed efficiency is calculated as:

$$CEE = VA/CE$$

Where,

CEE = Capital employed efficiency,

VA = Value added,

CE = Capital employed

Finally, in the last step, value added intellectual coefficient (VAIC) is ascertained.

$$VAIC = HCE+SCE+CEE$$

Where,

HCE = Human capital efficiency,

SCE = Structural capital efficiency,

CEE = Capital employed efficiency

3.2. Dependent and Control Variables

For conducting the analysis, two traditional accounting performance measures namely, return on asset (ROA) and Market valuation ratio (MB) has been applied as dependent variables. Apart from this, one control variable has also been used in the study. A brief explanation of their calculation is given next:

- ROA = Net Income/average total assets

ROA is an indicator of how profitable a company is in relation to its total assets.

- MB = Market capitalization/ Book value of common stock

MB reflects the market to book value of the companies indicating market valuation of the company.

- DER =Total debt/ total equity

DER measures what proportion of equity and debt is used by company in financing its assets.

- SIZE = Total assets = Log (Total assets)

Size of the firm as measured by the natural log of total assets, is used here to control the impact of size.

3.3 Regression Models for Analysis

In order to achieve the research objectives, the following models have been developed for carrying out the analysis:

- $ROA = \alpha_{it} + \beta_1 VAIC_{it} + \beta_2 DER_{it} + \beta_3 SIZE_{it} + \varepsilon_{it} \dots \dots \dots (i)$
- $MB = \alpha_{it} + \beta_1 VAIC_{it} + \beta_2 DER_{it} + \beta_3 SIZE_{it} + \varepsilon_{it} \dots \dots \dots (ii)$
- $ROA = \alpha_{it} + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + \beta_4 DER_{it} + \beta_5 SIZE_{it} + \varepsilon_{it} \dots \dots \dots (iii)$
- $MB = \alpha_{it} + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + \beta_4 DER_{it} + \beta_5 SIZE_{it} + \varepsilon_{it} \dots \dots \dots (iv)$

Where, α = Constant term; VAIC = Value Added Intellectual Coefficient; ROA = Return on Assets; MB = Market valuation; HCE=Human capital efficiency; SCE= Structural capital efficiency, CEE= Capital employed efficiency; DER = Debt Equity Ratio; SIZE = Market Capitalization and ε =Error term.

4. Results and Discussions

4.1 Descriptive Statistics

The descriptive statistics shown in Table 1 shows that the average value of VAIC is 4.877 which indicate that Indian real estate companies created 4.87 rupees for each rupee employed in intellectual capital. The average value of ROA is 0.065 indicates that the companies of this sector

are not getting a fair return on its assets. The average value of MB ratio is 2.817 which show that Indian IT sector companies' market value is higher than its book value. The average value of DER is 1.354 indicates that there is more use of debt in comparison to its equity capital.

Table 1: Descriptive Analysis of all Variables

	VAIC	ROA	MB	DER	SIZE
Mean	4.877	0.087	2.817	1.754	1376.12
Std. Dev.	0.167	0.202	3.604	0.453	4264.24
Median	0.044	0.126	1.727	0.572	178.15
Minimum	-2.94	-0.64	0.106	0.009	0.117
Maximum	0.617	1.271	30.22	0.95	27864.85

4.2 Regression Analysis

4.2.1 VAIC and Financial Performance

The results of the regression analysis are shown in Tables 2 respectively. Table 2 exhibits the result of the regression models where ROA and MB are taken as dependent variable and VAIC is taken as independent variable. Both fixed and random effect model have been used for the analysis. Hausman test has been used to check which model should be used for analysis. In case, if Hausman X^2 result found significant, fixed effect model is used and when it is found insignificant then Random effect model is preferred for the analysis. From the table 2, it is shown that for both ROA and MB, Result of Hausman test statistics is found significant, indicating that fixed effect model is more appropriate.

Table 2: Regression Results of IC and Financial Performance of Real Estate Companies

	Dependent Variables			
	Return on Assets		Market Valuation	
	Fixed effect	Random effect	Fixed effect	Random effect
C	0.151 (1.533)	0.062 (1.725)	-6.474** (-1.204)	-0.319 (-0.788)
VAIC	0.016* (1.265)	0.011* (2.549)	-0.177 (4.257)	0.464 (1.933)
DER	-0.063* (-17.456)	-0.021* (-13.425)	-0.021 (-0.614)	-0.009 (-0.136)
SIZE	-0.026** (-1.558)	-0.005 (-0.418)	2.176** (3.107)	0.399 (0.656)
Adj. R²	0.648	0.459	0.534	0.083
F-value	66.633*	25.660*	56.757*	17.154
Hausman test	X ² (3) 19.082*		X ² (3) 33.420*	

Note: *, ** and *** represents level of significance at 1 percent, 5 percent and 10 percent respectively. Values of t-statistics are provided in parenthesis below the co-efficient estimates.

From the table 2, it is found that VAIC is playing a significant role in increasing the ROA of the companies. The control variables, DER and SIZE showed a significant negative relationship in increasing the return on asset. Hence, in the light of the results, H_{01} is accepted means VAIC is having a significant impact on profitability of the company. Table 2 also found that VAIC is not playing any significant role in increasing the market value of the IT companies. It indicates that investors do not consider the value of IC efficiency regarding their investment decisions. The control variable size is contributing significantly in increasing the marker valuation of the companies. Hence, in the light of the results, H_{02} is rejected means VAIC is not having any significant association with MB of the companies.

4.4.4 VAIC Components and Financial Performance

The table 3 exhibits the result of the regression models where ROA and MB are taken as dependent variable and VAIC components have been taken as independent variable. Both fixed and random effect model have been used for the analysis. From the table 3, it is found that for both ROA and MB models; Hausman test statistics is found significant, indicating that fixed effect model is more appropriate for both the models.

Table 3: Regression Results of IC Components and Financial Performance of Real Estate Companies

	Dependent Variables			
	ROA		MB	
	Fixed effect	Random effect	Fixed effect	Random effect
Intercept	0.534* (5.893)	0.147* (4.375)	8.634* (8.580)	2.126* (4.366)
HCE	0.023* (1.001)	-0.004 (-1.475)	0.032 (0.852)	-0.044 (-1.320)
SCE	0.008 (4.883)	0.016 (3.458)	0.012 (2.943)	1.041 (3.853)
CEE	0.455* (2.731)	0.289* (27.034)	0.471* (4.058)	0.605* (4.599)
DER	0.007 (0.441)	0.013 (1.401)	0.218* (2.742)	0.179 (1.282)
SIZE	-0.201* (-7.903)	-0.085* (-9.596)	-0.756* (-8.763)	-0.547** (-2.524)
Adjusted R ²	0.545	0.295	0.298	0.024
F statistic	18.562*	119.652*	4.553*	6.024*
Hausman test	X ² (6) = 86.815*		X ² (6) = 83.941*	

Note: *, ** and *** represents level of significance at 1 percent, 5 percent and 10 percent respectively. Values of t-statistics are provided in parenthesis below the co-efficient estimates.

From the table 3, it is found that human capital is playing a significant role in raising the profitability of the companies. This finding support H_{03} implying that human capital has a significant relationship with profitability. When association of human capital efficiency with

market valuation was examined, it is found that human capital has no significant relation with market valuation. This result rejects hypothesis H₄ implying that human capital is not contributing in increasing the market value for the shareholders.

When the Impact of structural capital on dependent variables were examined, table 3 shows that structural capital is not having any contribution in increasing the profitability (ROA) and market valuation (MB) respectively. These findings do not accept H₅ and H₆ implying that SCE has no relationship with financial performance and market valuation. This finding is not consistent with studies of Komnenic and Pokrajcic, 2012; Jardon and Martos, 2009, who all found a positive relation between structural capital and financial performance.

Table 3 also shows that physical capital is contributing significantly in increasing the profitability and the market value of the companies. The findings support H₇ and H₈ implying that physical capital plays a significant role in increasing the profitability and market valuation of the companies. The Capital employed efficiency (CEE) is found to be the strongest and highly significant predictor. Control variables Leverage was found to have no significant impact on any dependent variable respectively. SIZE control variable has significant negative relationship with profitability and market valuation implies that larger size of the companies contribute negatively in increasing the financial performance.

4.3 Conclusion

In this study, the relationship between intellectual capital efficiency and financial performance was analyzed using ROA and MB as indicators of financial performance. It is found from the study that intellectual capital has a significant effect in increasing profitability. In other words, the profitability is positively influenced by efficiently using the intellectual capital. The results also came up with the finding that intellectual capital is not playing any significant role in increasing the market valuation of the companies, which indicates that Indian investors do not pay attention to intellectual capital at the time of evaluating the company.

When the components of VAIC were examined for their relationship with profitability and market valuation, it is found that human capital efficiency is not contributing in increasing the market valuation of the companies. It means companies which have more expenditure on employees in comparison to physical capital tend to be less valued in the market by the investors. Regular training and development programs may be started for employees the better utilization of the human resources. The results also found that structural capital efficiency is not having any significant relationship with profitability and market valuation respectively. The structural capital must be given due emphasis by organizations as it gives supportive environment to its employees. The results also analysed that physical capital is significantly associated with profitability and market valuation of the company. In order to compete with developed and developing countries, Indian companies need to pay more concentration on the development of IC.

In the view of the above, it is advisable for academics, managers and government officials to take a more active role in encouragement of development of IC. Managers are needed to give more considerations to human resources and structural resources for increasing profitability and market valuation of the company. The disclosure of IC may be made a mandatory requirement for the

companies which will allow IC statements to be included in the annual reports of every listed company.

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