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# THE IMPACT OF INTELLECTUAL CAPITAL ON THE INDIAN REAL ESTATE SECTOR PROFITABILITY AND PRODUCTIVITY

**Karam Pal Narwal*, Nisha Yadav****

**Abstract** *To meet the global competition, the general concentration of Indian corporate is on physical and intellectual capital. The intellectual capital resources keep on changing the effect on the company's performance. The organisations that expect most recent change and rebuild their intangible resource base may increase additional competitive advantage in the economy. There is no doubt that booming companies across all industry sectors are utilising intellectual capital to gain economic advantage. The objective of this paper is to examine the IC and its components, known as human capital, structural capital, and customer capital, and their interrelationship with the performance of the Indian real estate sector to illuminate whether value created by tangible intensive firms can be evaluated better utilizing by IC for the time of 2005 to 2015. VAIC™ developed by Ante Pulic (1998) is used as a methodology. Pearson Correlation and OLS regression are used to find relationships between variables that are explaining value creation activity. The finding of this study reveals that value added intellectual coefficient indicated a positive and significant association with the profitability of the Indian real estate sector.*

**Keyword:** *Intellectual Capital, Real Estate, Capital, Firms Value*

**JEL Codes:** *O34, R30, E22, G31*

## INTRODUCTION

During the most recent couple of decades, various aspects of intellectual capital have enrolled development and improvement, with intellectual capital power driving huge advancement in the field of research, technology, and overall advancement in the economy. Rich intellectual resources and the method of perceiving and recording these have given increased competitive edges for enterprises and countries. The researchers, practitioners, and academicians are progressively seeing intellectual capital as a primal determinant of business performance in the organisations. Intellectual capital (IC) is a real business asset, although measuring it is sometimes a little bit difficult task. IC lacks in physical substance usually hard to evaluate and not normally shown on the balance sheet. IC assets are summed up to create a wealth. The researchers, practitioner, groups, and bodies categorised IC as human capital and structural capital (Edvinsson & Malone, 1997; Roos & Roos, 1997; Roos, Roos, Edvinsson, & Dragonetti, 1997) later on customer capital also annexed in IC categorisation (Stewart, 1998; Canibano *et al*., 2000; Sanchez *et al.*, 2000). IC has become a key resource of value creation in today's economy.

The requirement for and to get advantage from IC for organisations in knowledge intensive sectors which incorporate high-tech and service industries, have a tendency to put to a great extent in IC. This reality makes suitable and alluring to the high-tech and service industries for IC exploration (Hermans & Kauranen, 2005). Indeed, even despite its significance, IC acknowledgment, assessment and reporting are not all that simple undertaking. Identification and estimation of IC and its components are not effectively suited by conventional accounting practice. Based on the international accounting standard IAS 38, intangible assets list in financial statements is prohibited (IASB, 2004). In developing nations, the issue emerges of what makes value and how to gauge it is crucial for coordinating further coming new speculations. Presently, like never before, in today's financial circumstances, no business can really flourish unless it capably deals with its all connections of wealth creation exercises. The real estate sector leveraging their value creation assets; focus on what matters the most. The challenges crop up in real estate sector due to a dynamic, complex, and competitive environment. To meet the global and domestic competitive range, focus on intellectual capital should be necessitated.

* Professor, Haryana School of Business, Guru Jambheshwar University of Science & Technology, Hisar, Haryana, India. Email: karampalsingh@yahoo.co.in

** Research Scholar, Haryana School of Business, Guru Jambheshwar University of Science & Technology, Hisar, Haryana, India. Email: yadav.nisha17@gmail.com

India can be a leading destination for real estate business globally suggested by the demographic statistics. It is estimated that the size of the real estate sector expected to increase US$ 180 billion by 2020 (IBEF, 2016). To promote growth in housing and urban infrastructure stock, attract foreign investment, the Govt. of India has taken commendable steps and is finalising several other landmark reforms to encourage the development of the sector. The real estate sector consists of four sub-sectors: retail, housing, hospitality, and commercial (IBEF, 2013). Its growth is complemented by the growth of corporate environment. Corporate real estate is generally capital intensive, illiquid and specific to certain industries; these are particularly the operational properties, e.g. industrial buildings, agriculture land, hotels, leisure properties, etc. These are specialised properties which are not traded frequently in the property market (French, 2004). During the crisis, it affects the perception of risk and credit worthiness of a firm then such properties are bought. In Indian companies, the real estate sector drives development and is used as an indicator of growth. This real estate sector is known as tangible intensive, although the way of value created in this sector in recent years provoked discussion on how to identify value drivers which can be explained by capital access and use.

This paper is organised in following sections: discussing the prior IC literature, capturing the relationship between value added by IC and real estate sector performance within India. The hypothesis to be tested and method used to test the relationships are described in the next sections. The results are outlined and offered some conclusions based on the results.

## LITERATURE REVIEW

Intellectual capital is the foremost resource for the rapid growth of the global knowledge economy. Intellectual capital was created as a concept for updating the understanding of the competitive edge of business in knowledge-intensive, rapidly changing business environments. A bundle of research has been made towards developing a modern definition of IC but still most of the authors finally agreed on its basic parameters. Klein and Prusak (1994) forwarded universal definition by defining IC as the intellectual material that can be formalised, captured, and leveraged to a high valued asset. Some more definitions of intellectual capital are summarized. Edvinsson and Sullivan (1996) defined that knowledge can be converted into value. According to Bontis (1999), intellectual capital had three components: Human Capital, Structural Capital, and Relational Capital.

According to the Ting and Lean (2009), the significant positive effect on profitability increased the value creation efficiency of the firm. More utilisation of IC resources maximizes the stakeholder's benefits. Clarke, Seng, and Whiting (2011) investigated that physical and financial capital had the strongest influence on firm's performance; it was also found that intangible values were not the sole driver of firm success, but are seen to have a small positive effect on IC and performance. Maditinos, Chatzoudes, Tsairidis, and Theriou (2011) argued that IC was recognised as an important strategic asset for sustainable competitive advantage, but results were failed to support such a claim. It was also suggested that innovation, competitiveness, and entrepreneurship indexes in Greece need to be improved. Petty and Guthrie (2000) opined that intellectual capital is an important intangible asset and it must be measured and reported without referring empirical research. The research undertaken by Bontis (1997) on Portuguese bankers' association-affiliated members found that value was created when intellectual capital components interact with each other. More interaction amongst component generates more value. A study conducted by Kamukama (2013) examined that individual influence of intellectual capital elements on competitive advantage in Uganda. It was overall found that IC elements were strong predictors of competitive advantage which varied in such a way: structural capital, human capital, and relational capital.

Muhammad and Ismail (2009) empirically investigated 18 financial sector companies in Bursa, Malaysia and found that intellectual capital has more influence in banking institutions as compared to insurance and security brokerage companies. The performance efficiency of human capital was more than structural and physical capital. Mondal and Ghosh (2012) argued that the intellectual capital was the major determinant of the performance of the banks. It was also concluded that intellectual assets are used to reduce cost, improve efficiency, and enhance innovative activities in Indian banks.

According to the Pal and Soryia (2012), Indian investors werenot considered as intellectual capital in the important investment decisions. They also found that market valuation was not influenced by IC. Murale, Jayaraj, and Ashrafali (2010) empirically found that a positive relationship between market to book value and financial performance. Morariu (2014) investigated that human capital contributed major role to reduce the Romanian public companies' productivity. It was also found that being an emerging economy the Romanian companies may not afford the cost for properly managed structural capital. Nimtrakoon (2015) found that the market value and financial performances were improved using intellectual capital as a resource attribute.

In the summary of literature review, the researchers, analysts and practitioners shed some light on the significant positive relationship between IC and performance variables (Vishnu & Gupta,2014; Clarke *et al*., 2011; Ahangar, 2011; Murale *et al.*, 2010; Sharabati, Jawad, & Bontis,2010).Some of them also found negative relationship with the performance variables (Celenza & Rossi, 2014; Zeghal & Maaloul, 2010), remaining partial but significant relationship (among

all variables, one or two variables had positive relationship and rest had negative relationship) with the performance variables (Mondal & Ghosh, 2012; Pal & Soriya, 2012; Komnenic & Pokrajcic, 2012).

Taking an insight into the studies conducted in the emerging economies pointing the overall observation to measure IC and value creation,a variety of sectors such as hotels (Laing, Dunn, & Huges-Lucas,2010), banking and finance (Ahmadi, Habibi, & Khodamoradi, 2011, Ting and Lean, 2009), manufacturing, food and beverages (Khani, Habibi, & Khodamoradi, 2011, Ong, Yeoh, & Teh, 2011), pharmaceutical (Mehralian, Rajabzadeh, Sadeh, & Rasekh, 2012) and textile (Pal & Soriya, 2012) are covered. The real estate sector is new to evaluate the impact of IC and their components on firm's profitability and productivity. The research gap in the literature is to check whether IC can better explain the value generated by tangible companies, especially real estate sector companies.

## DATA AND METHODOLOGY

### Source of Data

The data used for analysis have been collected from the CMIE prowess database of 90 real estate companies listed on BSE (Bombay Stock Exchange). The companies are limited to one sector as to obtain homogenous data sample. The sample of 55 companies is taken because complete 11 year's information for the rest of 35 companies is not available. These 55 companies represented all Indian real estate sector companies listed on Bombay Stock Exchange from the financial year 2005-2015.

### Dependent variables

The two traditional financial indicators used as dependent variables are ROA for profitability and ATO for productivity. DuPont Analysis is a method of performance measurement that was started by DuPont Corporation in 1920s. DuPont salesman Donaldson Brown invented this formula in an internal efficiency report in 1912. The decomposition of the return on equity into various factors such as asset turnover and return on assets influencing company performance are shown in Fig. 1.

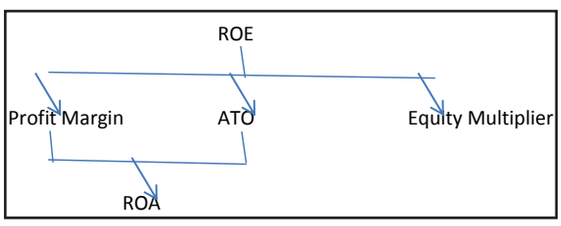


**Fig. 1: Decomposition of ROE**

Return on Assets (ROA) evaluates how effectively assets are used. It measures the combined effect of profit margin and asset turnover.

ROA= (Net Income/Sales)*(Sales/Total Assets) = Net Income/ Total Assets

Asset Turnover Ratio (ATO) is a key component of DuPont analysis to evaluate how efficiently a company can *use* its assets to generate sales.

ATO= Net Sales Revenue/ Average Total Assets

### Independent Variables

The VAIC™ model is developed by Ante Pulic (1998) used as a variable of intellectual capital and shows how much new value is created by a rupee spent on intellectual capital assets (Nazari & Herremans, 2007). The additional value generated by IC of the companies can be measured by HCE (Human Capital Efficiency), SCE (Structural Capital Efficiency), and CEE (Capital Employed Efficiency). This efficiency is given by how much resources were utilised to engender value added (VA).The first step in calculating HCE, SCE, and CEE are to determine firms total value added (VA). According to Pulic (2004), value added is the difference between an output (revenues) and input (outside purchase materials and services).

VA = OUTPUT-INPUT=I + T + WS+NI

where I stand for Interest Expenses, T is Corporate Taxes, WS is Wages and salaries, and NI is Net Income. A company that spends fewer resources to make VA is more efficient as compared to company spends higher expenditure in other resources. The components of VAIC and how to calculate them are defined in Table 1.

**Table 1: Components of VAIC**

| Independent Variables | Formula Exploration | Remarks |
|---|---|---|
| VAIC | HCE+SCE+CEE | How much VA created by spent rupee on IC |
| HCE | VA/HC | How much VA created by spent rupee on employees |
| HC | SALARY & WAGES | Skills, experience, productivity and knowledge |
| SCE | SC/VA | How much VA created by spent rupee on structure |
| SC | VA-HC | Strategy, organizational network, patents and brand names |
| CEE | VA/CA | How much VA created by spent rupee on capital employed |
| CE | Total Assets- Intangible Assets | |

## Control variables

1. **Debt to Equity Ratio (DER):** It is used to measure a company's financial leverage. It indicates the proportion of equity and debt a firm is using to finance its assets. It is expressed as total liabilities / stockholder's equity.
2. **Size of the firm (SIZE):**It is natural log of total assets. It is used to control for the impact of size of the firm on corporate performance.

## Research hypothesis

The following hypotheses arise if the market evaluates IC in projections indirectly by considering a strategic alliance, brand names, organisational network, and other value drivers in the analysis.

**H1:**Higher intellectual capital in real estate companies generates higher profitability.

**H2**:Higher intellectual capital in real estate companies generates higher productivity.

## Research framework

To capture the relationship and to evaluate the firm's performance, the following regression modelsare framed to test the hypothesis of profitability and productivity on the explanatory and control variables:

$$ROA = \alpha + \beta_1 VAIC + \beta_2 DER + \beta_3 SIZE + \varepsilon \quad (1)$$

$$ATO = \alpha + \beta_1 VAIC + \beta_2 ROA + \beta_3 DER + \beta_4 SIZE + \varepsilon \quad (2)$$

where, $\alpha$ = Intercept, $\beta_1 - \beta_5$= Coefficients of the respective variables, $\varepsilon$ = Error term

## FINDINGS AND ANALYSIS

According to the efficiency model, researchers set the minimum value of VAIC as zero because it is not realistic to have a negative value for VAIC. Results in Table 2 indicates the descriptive statistics of the real estate sector. The average value of VAIC is 12.457 stipulating the real estate sector efficiently utilizing intellectual capital. The value added intellectual coefficient evaluates the entire efficiency by human, structural, and physical capital. The mean value of the HCE that is 11.383 manifests the leading value creation reference.Human capital efficiency (HCE) is found to be the strongest predictor with the highest descriptive value.But the total value of VAIC exhibits real estate sector has a suitable wave to boost the investment in intellectual capital assets. The comparison between HCE and CEE suggests that during the study period the sample companies are generally more effective in creating VA from their IC (HCE=11.383) than from physical and financial capital employed (CEE=0.169). Measure of profitability ROA and productivity measure ATO demonstrates that real estate sector does not deploy assets perfectly during the study period.

**Table 2: Descriptive statistics of Real estate sector**

| | η | Mean | Median | Max. | Min. | Std. Dev. | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|---|
| **Panel A: Independent variables** | | | | | | | | |
| VAIC | 592 | 12.457 | 6.781 | 255.120 | -137.301 | 22.936 | 4.648 | 50.577 |
| HCE | 592 | 11.383 | 5.756 | 253.409 | -138 | 22.753 | 4.715 | 51.598 |
| SCE | 592 | 0.903 | 0.858 | 49.000 | -4.192 | 2.110 | 20.391 | 459.586 |
| CEE | 592 | 0.169 | 0.123 | 2.998 | -5.993 | 0.355 | -7.48 | 164.474 |
| **Panel B: Dependent Variables** | | | | | | | | |
| ROA | 592 | 0.049 | 0.030 | 0.953 | -1.629 | 0.121 | -2.468 | 75.040 |
| ATO | 592 | 0.364 | 0.253 | 2.613 | 0.000 | 0.376 | 1.956 | 8.199 |
| **Panel C: Control variables** | | | | | | | | |
| SIZE | 592 | 599.165 | 91.075 | 20459.08 | 0.010 | 2047.648 | 7.557 | 66.383 |
| DER | 592 | 0.943 | 0.460 | 13.600 | 0.000 | 1.661 | 3.689 | 19.267 |

Correlation analysis is the initial and crucial statistical technique used to check the association between the independent and the dependent variables. Pearson correlation test is applied to check the relationship between the influencing variables. The findings in Tables 3testify that VAIC (0.510, prob. < 0.01) value is significant at one percent level of significance and positively correlated with ROA. It shows that even if little investment happened in intangible assets it leads to profitability. In the same manner, correlation among VAIC and ATO is positive but not significant. The

control variable (SIZE and DER) shows the positive and significant relationship with VAIC but negative relationship with profitability and productivity of the real estate sector. This negative relationship indicated that size of the real estate sector does not affect the profitability and productivity of the sector.

Table 4shows the findings from Pearson correlation between VAIC components and the dependent variables. The HCE (0.511, prob. <0.01) and CEE (0.358, prob. <0.01) are significantly and positively correlated with financial performance indicator of profitability(ROA). This means that companies with relatively high human capital and capital employed were likely to play a major role to have high profitability. No significant correlation was shown between SCE and dependent variables (ATO and ROA) and control variables (SIZE and DER). This means that company efficiently used their SCE were likely to have recordeda negative correlation with ATO and ROA. HCE is positive but no significant association with ATO. The result implies that human capital with the prompt assistance of physical capital can ensure the real estate sector future growth in India.

**Table 3: Pearson Correlation Among Variables**

| | VAIC | ROA | ATO | SIZE | DER |
|---|---|---|---|---|---|
| VAIC | 1.000 | | | | |
| ROA | 0.510* | 1.000 | | | |
| ATO | 0.042 | 0.262* | 1.000 | | |
| SIZE | 0.109* | -0.024 | -0.095 | 1.000 | |
| DER | 0.103* | -0.052 | 0.000 | 0.007 | 1.000 |
| **Note:** *represents level of significance at one percent | | | | | |

The overall correlation association results imply that higher level of VAIC was associated with higher level of profitability. The relationship analysis reveals that the human capital assets play more important role than the physical and structural assets in profitability and productivity of the Indian real estate sector.

**Table 4: Pearson Correlation Among Variables**

| | HCE | SCE | CEE | ROA | ATO | SIZE | DER |
|---|---|---|---|---|---|---|---|
| HCE | 1.000 | | | | | | |
| SCE | 0.002 | 1.000 | | | | | |
| CEE | 0.223* | -0.024 | 1.000 | | | | |
| ROA | 0.511* | -0.019 | 0.358* | 1.000 | | | |
| ATO | 0.044 | -0.064 | 0.320* | 0.262* | 1.000 | | |
| SIZE | 0.110* | -0.003 | -0.001 | -0.024 | -0.095 | 1.000 | |
| DER | 0.104* | -0.009 | -0.005 | -0.052 | 0.000 | 0.007 | 1.000 |

**Note:** *represents level of significance at one percent

Table 5shows the results of regression coefficients for all explanatory variables, using financial performance (ROA) as the dependent variable. The adjusted R-squared value is 0.275 for simple regression, 0.326 for fixed effect, and 0.274 for random effect (0.327) which indicates that the model is able to explain the variance of the dependent variable that is more than 27 percent in case of ordinary least square, 33 percent for fixed effect and more than 27 percent for the random effect. Hausman test clearly showing the fixed effect model is best suited for the analysis. The study indicated that size and debt equity ratio is not affecting the profitability of the real estate sector. Value added intellectual coefficient has a significantly positive correlation with financial performance indicator ROA. This result indicates that increase in intellectual capital efficiency leads to increase in profitability of the companies. This result supports *H1*thatIC plays an important role in creating value for the real estate sector. Moreover, this finding confirms prior studies conducted by Chen *et al*. (2005) and Tan *et al*. (2007) who also found a significant positive association between IC and financial performance (ROA).

**Table 5: Regression on Return on Assets (Model 1)**

| | OLS | | | Fixed | | | Random | | |
|---|---|---|---|---|---|---|---|---|---|
| **Variables** | **Coeff.** | ***t*-stat** | **Signf.** | **Coeff.** | ***t*-stat** | **Signf.** | **Coeff.** | ***t*-stat** | **Signf.** |
| Constant | 0.024 | 4.522 | * | 0.013 | 2.106 | ** | 0.022 | 3.646 | * |
| VAIC | 0.002 | 14.984 | * | 0.003 | 14.507 | * | 0.002 | 15.187 | * |
| DER | -0.007 | -3.029 | * | 0.001 | 0.479 | | -0.005 | -2.171 | ** |
| SIZE | 0.000 | -2.309 | ** | 0.000 | -1.669 | *** | 0.000 | -2.308 | ** |
| Adj $R^2$ | 0.2750 | | | 0.3264 | | | 0.2741 | | |
| F-stat | 75.755 | | | 6.024 | | | 75.39 | | |
| Prob. | 0.000 | | | 0.000 | | | 0.000 | | |
| Hausman Test | | | | | $X^2(3)$ 18.885* | | | | |

NOTE: *,** and *** shows significance at 1%, 5% and 10% respectively

**Table 6: Regression on Return on Assets (Model 2)**

| | OLS | | | Fixed | | | Random | | |
|---|---|---|---|---|---|---|---|---|---|
| **Variables** | **Coeff.** | ***t*-stat** | **Signf.** | **Coeff.** | ***t*-stat** | **Signf.** | **Coeff.** | ***t*-stat** | **Sigsnf.** |
| Constant | 0.016 | 2.86 | * | 0.008 | 1.26 | | 0.016 | 2.827 | * |
| HCE | 0.002 | 13.591 | * | 0.002 | 12.965 | * | 0.002 | 13.793 | * |
| SCE | -0.0004 | -0.452 | | -0.0007 | -0.097 | | -0.0008 | -0.446 | |
| CEE | 0.085 | 7.286 | * | 0.068 | 5.34 | * | 0.085 | 7.337 | * |
| DER | -0.007 | -2.972 | * | 0.001 | 0.34 | | -0.007 | -2.897 | * |
| SIZE | 0.000 | -2.236 | ** | 0.000 | -1.414 | | 0.000 | -2.26 | ** |
| Adj $R^2$ | 0.3340 | | | 0.3582 | | | 0.3327 | | |
| F-stat | 60.285 | | | 6.591 | | | 59.952 | | |
| Prob. | 0.000 | | | 0.000 | | | 0.000 | | |
| Hausman Test | | | | | $X^2(5)$ =23.790* | | | | |

NOTE: * and ** shows significance level at 1% and 5%respectively

To test the first hypothesis deeply, framed a regression model 2: $ROA = \alpha + \beta_1 HCE + \beta_2 SCE + \beta_3 CEE + \beta_4 DER + \beta_5 SIZE + \varepsilon$. The results are shown in Table 6 for the regression analysis on the determinants of VAIC with dependent variable ROA. Human capital efficiency (HCE) shows a positive sign with regards to profitability means that .002 value created by .001 rupee spent on the employees in the Indian real estate sector. The regression analysis shows that structural capital is not associated with profitability. Corrall (1999) pointed out that it is management's responsibility to covert human capital (tacit knowledge which encapsulated in employees)into the structural capital in the forms of routines and procedures to ensure the efficient running of the company.

To test the hypothesis H2, regression analysis findings in Table 7shows that the dependent variable ATO is not influenced by the VAIC. The results show that the adjusted R-squared value 0.1022 indicates that the random effect model is able to explain the variance of the dependent variable that is more than 10 percent having the explanatory power. Bellman (2003) stated that an adj. $R^2$ of 0.10 can be considered satisfactory and worth reporting in an exploratory model. Size of the real estate sector does not affect the value creation activities.

**Table 7: Regression on Asset Turnover (Model 3)**

| | OLS | | | Fixed | | | Random | | |
|---|---|---|---|---|---|---|---|---|---|
| **Variables** | **Coeff.** | ***t*-stat** | **Signf.** | **Coeff.** | ***t*-stat** | **Signf.** | **Coeff.** | ***t*-stat** | **Signf.** |
| Constant | 0.340 | 17.779 | * | 0.322 | 19.222 | * | 0.327 | 8.628 | * |
| VAIC | -0.001 | -2.478 | * | 0.0001 | 0.227 | | 0.000 | -0.154 | |
| ROA | 0.995 | 6.921 | * | 0.718 | 6.519 | * | 0.749 | 6.858 | * |
| DER | 0.006 | 0.726 | | 0.013 | 1.576 | | 0.011 | 1.431 | |
| SIZE | 0.000 | -1.89 | ** | 0.000 | -1.398 | | 0.000 | -1.645 | *** |
| Adj R | 0.08 | | | 0.5439 | | | 0.1022 | | |
| F-stat | 13.909 | | | 13.153 | | | 17.821 | | |
| Prob. | 0.000 | | | 0.000 | | | 0.000 | | |
| NOTE: * ,** and *** shows significance level at 1%, 5% and 10% respectively | | | | | | | | | |

**Table 8: Regression on Asset Turnover (Model 4)**

| | OLS | | | Fixed | | | Random | | |
|---|---|---|---|---|---|---|---|---|---|
| **Variables** | **Coeff.** | ***t*-stat** | **Signf.** | **Coeff.** | ***t*-stat** | **Signf.** | **Coeff.** | ***t*-stat** | **Signf.** |
| Constant | 0.316 | 15.778 | * | 0.302 | 17.48 | * | 0.307 | 0.036 | * |
| HCE | -0.002 | -2.812 | | -0.0002 | -0.477 | | -0.0005 | -0.867 | |
| SCE | -0.009 | -1.392 | | -0.0003 | -0.073 | | -0.001 | -0.262 | |
| CEE | 0.279 | 6.469 | * | 0.185 | 5.580 | * | 0.195 | 5.939 | * |
| ROA | 0.716 | 4.936 | * | 0.585 | 5.313 | * | 0.603 | 5.517 | * |
| DER | 0.006 | 0.692 | | 0.012 | 1.500 | | 0.01 | 1.346 | |
| SIZE | 0.000 | -1.973 | | 0.000 | -1.190 | | 0.000 | -1.472 | |
| Adj $R^2$ | 0.1417 | | | 0.5676 | | | 0.15 | | |
| F-stat | 17.262 | | | 13.929 | | | 18.39 | | |
| Prob. | 0.000 | | | 0.000 | | | 0.000 | | |

NOTE: * shows significance level at 1%

Hence, the results rejected *H2*, implying that higher intellectual capital efficiency does not improve the productivity in the Indian real estate companies. The finding confirms prior study conducted by Kamath (2008) who also found no significant association between IC and productivity indicator ATO. Deep analysis is done to capture the individual effect of the VAIC determinants on the productivity indicator ATO which framed a model 4: $ATO = \alpha + \beta_1 HCE + \beta_2 SCE + \beta_3 CEE + \beta_4 ROA + \beta_5 DER + \beta_6 SIZE + \varepsilon$. The regression results clearly show that the productivity indicator ATO is not influenced by the human capital and structural capital. A company's management may find to justify the need to enhance human capital and structural capital inside the organisation to boost the productivity utilising the intangible value creation activities. Capital employed had the positive and significant association with the ATO. Control variable size does not affect the value creation activities in real estate sector.

## CONCLUSION

India is a developing country. Most of the organisations, firms, and sectors prevent the disciplines which are measuring and quantifying intangibles. The measures used in organisations, firms, and sectors are primarily transaction based, which show the historic tangible performance and are designed to be conservative. Consequently, neither balance sheet nor measures of national wealth point represent the true value of intangibles. Isolated knowledge set that lies in employee's minds which are not codified into organisational knowledge will never enhance the business performance. In other words, it's not enough for an organisation to hire and promote the vivid individuals; it must also support and nurture their vivid individuals to share their human capital through organisational learning and externalisation into the information system.

The finding from this research reveals that there is a positive association between ROA and VAIC and no significant association with ATO and VAIC. The study clearly indicated that human capital efficiency and capital employed efficiency have significant positive effect on profitability while structural capital is negatively associated with profitability. ATO is negatively influenced by the human capital and structural capital. In a different way, VAIC results demonstrate that development in value creation efficiency positively dominates the profitability and is not influenced by the productivity. Therefore, it is important to boost the utilisation of IC resources into order to blow up the company's profit. Another substantial finding is that IC is a crucial asset that can be used as a vector to boost the firm's performance. Besides that, the authors would like to recommend that researchers acknowledge examining the value creation efficiency towards long term objective in dealing with investor's wealth. Thus, how well companies work in acquiring and applying knowledge will become an extraordinary competitive factor. Managers, especially those working in knowledge-intensive sectors, need to know the fair value of IC and that knowledge is a crucial factor affecting a company's ability to remain competitive in the era of the global marketplace.

## PRACTICAL IMPLICATION AND FUTURE RESEARCH DIRECTION

Role of knowledge leaders is crucial in the knowledge economy (Seleim & Khalil, 2011) and they also should be familiar with the relationship between knowledge

creation and intellectual assets activities to reach with success towards their strategic goal. An important practical implication is that a structural capital component of IC does not significantly affect performance. Another implication regarding control variables' impact on dependent variables is mixed and not significant in most cases. The research implication with respect to IC performance for researchers, practitioners and academicians requires an understanding of the value creation process with a logical factor that can show reasons of nonexistence perfect relationship between firm's performance with their IC components. The managers and policymakers need to give more attention and investments towards innovation and IC components.

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