

## Intellectual Capital Efficiency and Financial Performance of Insurance Sector in Pakistan: a Panel Data Analysis

<sup>1</sup>Wasim-ul-Rehman, <sup>2</sup>Nabila Asghar and <sup>3</sup>Hafeez ur Rehman

<sup>1</sup>Hailey College of Commerce, University of the Punjab, Lahore-54590, Pakistan

<sup>2</sup>Department of Economics, Government College University, Faisalabad, Pakistan

<sup>3</sup>Department of Economics, University of the Punjab, Lahore-54590, Pakistan

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**Abstract:** The main purpose of this study is to measure the intellectual capital performance of insurance sector for the period 2006-2010 using both Value Added (VA) and Value Added Intellectual Coefficient (VAIC<sup>TM</sup>) model and observe intellectual capital performance's impact on financial returns of both life and non-life insurance sector. Using panel data the study analyzes the empirical relationship of Value Added (VA), VAIC<sup>TM</sup> and its performance components with performance indicators of insurance sector. The results of the study reveal the existence of positive relationship between the two approaches, VA and VAIC<sup>TM</sup> and financial performance indicators. As far as the existence of relationship between the performance components of VAIC<sup>TM</sup> and financial performance indicators is concerned, earning per share (EPS) is positively related to human capital efficiency (HCE). There emerges a negative relationship between capital employed efficiency (CEE) and returns on investment (ROI).

**Key words:** Intellectual Capital Performance Indicators • Value Added (VA) • Value Added Intellectual Coefficient (VAIC<sup>TM</sup>)

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### INTRODUCTION

Both physical and financial assets of an organization are regarded as tangible assets which are used to generate the future cash flow. The tangible assets of an organization are land, building, plant and machinery. Whereas the financial assets of an organization include owner's equity, retain earning, working capital and prepaid assets while the intangible assets include knowledge, skills and experience which are difficult to quantify in terms of value.

Insurance sector plays an important role in the development process of an economy. In Pakistan the insurance sector is right at an early stage facing business uncertainty due to poor business conditions. There are more than 40 insurance companies operating in Pakistan. Both years, 2008 and 2009, appeared to be difficult for insurance industry due to contraction in investment income and an increase in operating cost.

**Intellectual Capital:** Many definitions of IC based on both knowledge and economic point of view are available in the literature. Stewart (1997) [1] concludes that IC is knowledge, skill, experience and knowhow which can be used productively to generate the wealth for an organization. Bontis (2000) [2] argues that IC is an organizational knowledge and skill which creates competitive edge for an organization. IC is a knowledge which can be transformed into profit [3].

Porter (1999) [4] considers that the success of an organization in competitive environment is based on the use of intellectual assets known as valuable strategic assets which include human capital, structural capital and relational capital. Ting and Lean (2009) [5] conclude that IC is considered to be a strategic asset and is used for value creation which enhances the profitability of the firm. Most of the firms concentrate on increasing the output (Gross Income) and on minimizing the input (Operating Expenses) for enhancing the value added efficiency.

Maditinos *et al.* (2011) [6] are of opinion that VA has positive and significant impact on firms' profitability. This could only be possible if the firms have more output than input. Pulic (2001) [7] considers that IC is an employee's skills and abilities which are used to enhance value creation efficiencies of the firms.

**Components of Intellectual Capital:** Researchers have identified HC (skills, experience, abilities and innovativeness), SC (supportive infrastructure, processes, patents and copyrights) and RC (relationship with internal and external stakeholders).

**Human Capital:** In a knowledge base economy the importance of human capital cannot be overlooked. Human capital is a knowledge, skill and experience of employees which is considered to be one of the valuable strategic assets. The Centre for Educational Research and Innovation defines the human capital (HC), "knowledge, skills, competences and other attributes embodied to economic activity" [8]. Hayton (2005) [9] points out that human capital includes professional skill, knowledge, experience and expertise that may be used to gain the competitive advantage. Organizations which have well and efficient stock of human capital have competitive advantage and these organizations may have better capability to make strategic decisions in turbulent business environment.

Human capital has received a lot of attention of researchers, practitioners and academicians for the last couple of decades due to its strategic importance in the organizations. Multinational Companies (MNCs) are investing their huge capital on employees in the form of professional trainings and workers compensation benefits to enhance their intellectual abilities. Many organizations have failed to invest on employees for increasing the motivations and loyalty of workers which put their success and survival at risk. De Pablos (2003) [10] finds HC as one of the important components of IC for raising the efficiency and effectiveness of employees. Bontis *et al.* (2000) [11] observe that HC has positive relationship with organizational performance. Firms which have better human capital efficiency (HCE) have better financial performance. For details see Goh (2005) [12], Ahangar (2011) [13], Kamath (2007) [14], Tan *et al.* (2007) [15] and Rehman *et al.* (2011) [16].

**Structural Capital:** There has been an extensive use of information technology (IT) as one of the strategic assets of organizations for the last 25 years. Structural capital

being non-human asset is recognized as processes, procedures, rules, regulations, data bases, patents, trademarks and copyrights. The supportive infrastructure enables human capital to function properly. Pulic model states that SC can be obtained by subtracting human capital from the value added (VA). Pulic (2001) [7] tries to explore the relationship between structural capital and human capital and points out that more use of structural capital means lesser contribution of human capital. By using data of pharmaceutical and software industry the study concludes that there appears better performance of structural capital efficiency (SCE) as compared to human capital efficiency (HCE).

**Relational Capital:** The relational capital is recognized as relationship of organization with internal and external stakeholders. Cheng *et al.* (2010) [17] find that relational capital has positive and significant relationship with firms' performance. It is considered to be oriented relation which influences the performance of firms effectively. Prahalad and Ramaswamy (2000) [18] point out that customers are the sources of firms to increase the profitability and point out that financial competency is based on productive relationship of customers and firms. Organizations which allocate a huge budget for maintaining a positive relationship between firms and internal and external stakeholders have shown relatively better performance.

**Literature Review:** Many researchers have tried to evaluate the importance of IC in manufacturing, pharmaceutical and services industries. The empirical literature reveals that intellectual capital is one of the important and valuable strategic assets. Bontis *et al.* (2000) [11] examines the empirical relationship of IC performance and business performance. The results of the study show that there emerges positive and significant relationship between SC and business performance of both services and non-services industry of Malaysia while HC has only positive and significant relationship with services base industry. Chen *et al.* (2005) [19] and Cheng *et al.* (2010) [17] conclude that IC has positive impact on firms' financial performance. Kong (2007) [20] exposes the strategic importance of IC using the key five components of strategic management and finds that IC is one of the important instruments for gaining the competitive advantage and organizational survival.

Boekestein (2006) [21] examines the empirical relationship of intangible assets with firms' value added in pharmaceutical industry. Riahi-Belkhoui (2003) [22] and Saudah, Mike and Richard (2005) [23] find that IC has

positive relationship with financial performance. Goh (2005) [12] analyzes the empirical relationship between IC's performance components and financial indicators using the VAIC™ model and concludes that the value creation efficiency is positively correlated with human capital efficiency both in foreign and domestic industries. This indicates that investment on human capital is more returnable as compare physical and structural capital.

Ting and Lean (2009) [5] examine the relationship between VAIC™ and financial performance indicator ROA over the period of 1999 to 2007 in Malaysian financial sector and find that VAIC™ has positive and significant relationship with ROA. Tan *et al.* (2007) [15] find positive and significant relationship between IC's performance components and financial performance indicators of 150 registered companies at the Singapore Stock Exchange. The results of the study show that the financial performance is determined through Return on Equity (ROE), Earning per Share (EPS) and Annual Share Return (ASR). Gan and Saleh (2008) [24] try to measure the empirical relationship between IC's performance components with financial performance in highly technological intensive industries registered at Busra, Malaysia. The results of this study show that VAIC™ has positive relationship with profitability and output.

Muhammad and Ismail (2009) [25] analyze the impact of intellectual capital efficiency on firms financial performance and find that VAIC™ has positive and substantial relationship with financial performance and profitability of Malaysian financial sector whereas HCE and SCE do not have positive relationship with financial performance and profitability except CEE.

Laing *et al.* (2010) [26] examine the empirical relationship between IC and financial performance of Australian hotel industry and argue that IC performance is one of the strategic assets. The study concludes that VAIC™ performance heavily depends on Human Capital Efficiency (HCE) which indicates efficient staff has great capability to boost the financial performance of any organization through their effective decision making.

Joshi *et al.* (2010) [27] try to examine the VAIC™ performance components of 11 Australian Owned Banks for the period 2005 to 2007 and explore that HCE plays an important role in VAIC™ performance. It has significant and positive relationship with banks performance which indicates that Human Capital Efficiency (HCE) plays an important role for enhancing the efficiency of banks as compared to other structural and capital employed efficiency.

Ahangar (2011) [13] examines the empirical relationship between performance components of VAIC™ and Iranian firms' financial performance. The study finds that HCE has positive and significant relationship with profitability (ROA) whereas SCE and CEE have negative relationship with corporate performance. Zeghal and Maaloul (2010)[28]out that VAIC™ has a statistical significant relationship with financial, economic and market performance.

Maditinos *et al* (2011) [6] conducted a study to examine the empirical relationship between IC and firms' market and financial performance at Athens Stock Exchange and argue that IC is one of the important strategic assets and HCE has positive and significant relationship with firms' financial performance.

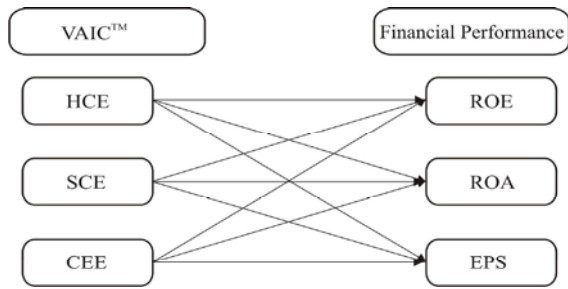
Rehman *et al.* (2011)[16] to explore various determinants of IC and its impact on financial performance of insurance sector of Pakistan by using cross sectional data. The results of the study show that human capital efficiency plays a significant role in intellectual capital performance of both life- and non-life insurance sector of Pakistan. The research work of Rehman *et al.* (2011) [16] fers from estimation defects as it uses cross sectional data.

Most of the above mentioned studies have used traditional OLS estimation technique. Not much studies are available in the literature which have used recent econometric techniques in the estimation of the model. This study is an attempt to analyze the relationship between IC performance of insurance sector and financial performance indicators by using panel data for Pakistan economy. The estimates of the present study may be more reliable as panel data analysis is preferable over other estimation techniques.

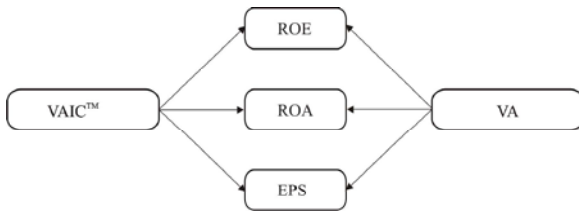
**Theoretical Model:** Keeping in view the relationship between variables, the following theoretical models are formulated:

**Proposed Research Hypotheses:**

- H1a : There is a positive relationship between (VA) and financial performance indicators (ROE, ROA and EPS).
- H1b : There is a positive relationship between (VAIC™) and financial performance indicators (ROE, ROA and EPS).
- H1c : There is a positive relationship between VAIC™ components (*i.e.* HCE, SCE and CEE) and financial performance indicators (*i.e.* ROE, ROA and EPS).



Theoretical Model 1



Theoretical Model 2

## MATERIALS AND METHODS

**VAIC™ Ante Pulic Model:** VAIC™ an Austrian approach is one of the important and consistent approaches for measuring the IC's performance of insurance sector. This approach is alternative to traditional approaches in which IC performance is based on assets, net profit and shareholder equity. Many researchers, practitioners and academicians have used this approach in their research work. For details see, Rehman *et al.* (2011) [11] Ahangar (2011), [13] Maditinos *et al.* (2011), [6] Zéghal and Maaloul (2010), [28], Joshi, Cahill and Sidhu (2010), [27], Laing, Dunn and Lucas (2010), [26], Diez *et al.* (2010), Ting and Lean (2009), [5], Abeysekera (2008), El-Bannany (2008), Makki, Lodhi and Rahman (2008), Gan and Saleh (2008) [24], Tan *et al.* (2007) [15], Yalama and Coskun (2007), Kamath (2007) [14], Bontis *et al.* (2000) [11], Boekestein (2006) [21],

Mohiuddin *et al.* (2006), Ji-jian *et al.* (2006), Chen *et al.* (2005) [19], Goh (2005) [12], Mavridis (2005), Kujansivu and Lonnqvist (2005), Goo and Tseng (2005), Mavridis and Kyrmizoglou (2005), Mavridis (2004) and Firer and Williams (2003).

### Definitions of Variables Used in the Analysis:

**Output** = Gross Premium (Since insurance companies are not manufacturing concerns, its Gross Premium is referred to output)

**Input** = Operating expenses (Input referred to all the operating expenses which are used to generate the gross premium other than personal costs)

**Value added** = Output - Input (VA referred to Output minus Input which is used to measure value added efficiency of firms)

**HC** = Personal cost (Salaries and Wages) considered as an investment

**HCE** = VA/HC (Human Capital Efficiency referred to per unit of value of human capital)

**CA** = Capital invested in physical and financial capital

**CEE** = VA/CA (Capital Employed Efficiency referred to per unit value of physical and financial assets)

**SC** = VA - HC

**SCE** = SC/VA (Structural Capital Efficiency referred to per unit value of structural capital)

**VAIC™** = HCE + CEE + SCE (Value Added Intellectual Coefficient)

**Econometric Methodology for Panel Data:** In this study the following model has been estimated:

$$Y_{it} = \beta_0 + \beta_1 x_{it1} + \dots + \beta_k x_{itk} + u_{it}$$

**The Data:** This study uses micro panel data for analyzing the relationship between the variables included in the model. The data have been collected from 24 insurance companies out of which 21 are general insurance (non-life insurance) companies and remaining 3 belong to life insurance sector. The sources of data are audited annual reports, relevant websites and Insurance Association of Pakistan (IAP) over the period of 2006 to 2010. Fixed Effects Model (FEM) is used to measure empirical relationship between VAIC™ and its components (*i.e.* HCE, SCE and CEE) and financial performance indicators (ROE, ROI and EPS).

**Fixed Effects Model (FEM):** FEM developed by Abowd *et al.* (1999) [29] has been employed to measure the relationship between dependent and independent variables of the model. Each insurance company has its own time-invariant characteristics that may or may not affect the dependent variable. FEM controls these time invariant characteristics of a company and explores the relationship between IC's components and financial performance indicators.

**The Equation for Fixed Effects Models Can Be Written as Follows:**

$$\begin{aligned} ROE_{it} &= \beta VA_{it} + \alpha_i + u_{it}(1) \\ ROI_{it} &= \beta VA_{it} + \alpha_i + u_{it}(2) \\ EPS_{it} &= \beta VA_{it} + \alpha_i + u_{it}(3) \\ ROE_{it} &= \beta (VAIC_{it}^{TM}) + \alpha_i + u_{it}(4) \\ ROI_{it} &= \beta (VAIC_{it}^{TM}) + \alpha_i + u_{it}(5) \\ EPS_{it} &= \beta (VAIC_{it}^{TM}) + \alpha_i + u_{it}(6) \\ ROE_{it} &= \beta_1 (HCE_{it}) + \beta_2 (SCE_{it}) + \beta_3 (CEE_{it}) + \alpha_i + u_{it}(7) \\ ROI_{it} &= \beta_1 (HCE_{it}) + \beta_2 (SCE_{it}) + \beta_3 (CEE_{it}) + \alpha_i + u_{it}(8) \\ EPS_{it} &= \beta_1 (HCE_{it}) + \beta_2 (SCE_{it}) + \beta_3 (CEE_{it}) + \alpha_i + u_{it}(9) \end{aligned}$$

Where

- $\alpha_i (i = 1 \dots n)$  = the unidentified intercept/cut off for the each company.
- $ROE_{it}$ ,  $ROI_{it}$  and  $EPS_{it}$  = the dependent variables for fixed effects models 1 to 9.
- $VA_{it}$ ,  $VAIC_{it}^{TM}$ ,  $HCE_{it}$ ,  $SCE_{it}$  and  $CEE_{it}$  = independent variable(s) for fixed effects models 1 to 9.
- $I$  = Company and  $t$  = time.
- $\beta$  is coefficient(s) and  $u_{it}$  is the error term.

**Performance of IC Based on VA and VAIC<sup>TM</sup>:** The performance of IC based on VA and VAIC<sup>TM</sup> is observed through the ranking of VA and VAIC<sup>TM</sup>.

The rationale of ranking is to assess the five year performance of IC of insurance sector of Pakistan based on VAIC<sup>TM</sup>. VAIC<sup>TM</sup> is the composition of HCE, CEE and SCE which is calculated each year over the period of five years of insurance sector of Pakistan.

Each insurance company is ranked according to its VAIC<sup>TM</sup> performance by summing up each year VAIC<sup>TM</sup> performance. So with respect to five year VAIC<sup>TM</sup> performance New Jubilee Insurance Company is the most efficient insurance company ( $VAIC_{it}^{TM} = 520.51 + 456.55 + 666.475 + 509.269 + 477.388 = 2630.21$ ) over the period of 2006 to 2010 for producing the best IC performance follow by Pakistan Reinsurance Company Limited ( $VAIC_{it}^{TM} = 72.97$ ), Shaheen Insurance Company Limited ( $VAIC_{it}^{TM} = 45.37$ ), The United Insurance Company Limited ( $VAIC_{it}^{TM} = 42.88$ ) etc whereas Central Insurance Company is the least efficiency company with respect with respect to ( $VAIC_{it}^{TM} = 13.45$ ) performance in non life insurance sector.

In life insurance sector each insurance company is also ranked according to its VAIC<sup>TM</sup> by summing up five years VAIC<sup>TM</sup> performance. In life insurance sector the most efficient insurance company with respect to

( $VAIC_{it}^{TM} = 152.67$ ) is East West Life Assurance Company, followed by New Jubilee Life Insurance Company ( $VAIC_{it}^{TM} = 150.622$ ) and EFU Life Assurance Company ( $VAIC_{it}^{TM} = 143.041$ ) base on five years VAIC<sup>TM</sup> performance.

In non-life insurance sector, New Jubilee Insurance Company is the highest efficient company of selected data.  $VAIC_{it}^{TM} = 2630.22$  means that if we invest five Rupees-PKR (one Rupee-PKR each year) it would generate the value up to (PKR = 2630.22) after the end of five years. Followed by Pakistan Reinsurance Company Limited (PKR = 73.75) whereas the least efficient company with respect to value generation based on VAIC<sup>TM</sup> is Central Insurance Company Limited where value is (PKR = 15.83).

Table 1 represents the ranking of VA in terms of value creation. The aim of ranking is to assess the performance of insurance companies. Each insurance company is ranked based on five years (VA) performance. The five year (VA) performance by summing up each year (VA) performance. Table 1 shows that New Jubilee Insurance Company is the most efficient company with respect of VAIC<sup>TM</sup> but it is ranked 3<sup>rd</sup> with respect to (VA). It created the value of (PKR 14958.829 Million). Pakistan Reinsurance Company Limited is second efficient company based on VAIC<sup>TM</sup> whereas it is ranked as 4<sup>th</sup> position with respect to VA. It created the value of (PKR 9647.551 Million). As far as the best insurance company with respect to VA ranking is Adamjee Insurance Company. It created the value of (PKR-28337.742 Millions) whereas this company is ranked at 7<sup>th</sup> position with respect to VAIC<sup>TM</sup>. However, EFU General Insurance Company, New Jubilee Insurance Company, Pakistan Reinsurance Company and Askari General Insurance Company holding the position at 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> respectively.

Furthermore, East West Life Assurance Company, New Jubilee Life Insurance Company and EFU Life Assurance Company are standing at 3<sup>rd</sup>, 2<sup>nd</sup> and 1<sup>st</sup> position respectively with regard to five years VA performance in terms of value. So far East West and EFU Life Assurance companies are reciprocal to each other with respect to VAIC<sup>TM</sup> and VA performance whereas New Jubilee Life Insurance Company is standing at 2<sup>nd</sup> position both in VA and VAIC<sup>TM</sup> performance.

**Empirical Results and Data Analysis:** Table 2 represents the empirical results of VA and VAIC<sup>TM</sup> and its performance components with financial performance indicators (ROE, ROI and EPS).

Table 1: Ranking of VA and VAIC™

S. No.	Non-Life Insurance	VAIC™ (Rs.)	VAIC™ (Ranking)	VA Million Rs.	VA (Ranking)
1	New Jubilee Insurance Company Limited	2630.22	1	14958.829	3
2	Pakistan Reinsurance Company Limited	72.97	2	9647.551	4
3	Shaheen Insurance Company Ltd	45.37	3	2308.749	6
4	The United Insurance Company Ltd	42.88	4	1597.706	9
5	EFU General Insurance Company	42.55	5	25885.636	2
6	Askari General Insurance Co. Ltd	40.71	6	2847.831	5
7	Adamjee Insurance Company Ltd	38.38	7	28337.742	1
8	Silver Star Insurance Company Limited	37.52	8	483.201	17
9	East West Insurance Company Limited	31.08	9	1284.462	13
10	IGI Insurance Company	27.09	10	1369.81	11
11	Reliance Insurance Company Ltd	26.87	11	2203.656	7
12	Atlas Insurance Ltd	26.10	12	1912.066	8
13	Universal Insurance Co. Ltd	25.51	13	1581.741	10
14	The Pakistan General Insurance Co. Ltd	23.26	14	428.346	18
15	The Crescent Star Insurance Co. Ltd	22.36	15	323.643	19
16	Habib Insurance Co. Ltd	21.66	16	885.301	15
17	Century Insurance Co Ltd	21.10	17	1387.853	12
18	Premier Insurance Co. Ltd	20.83	18	1274.254	14
19	PICIC Insurance Co. Ltd	18.42	19	873.056	16
20	Saudi Pak Insurance Company Limited	16.25	20	46.344	20
21	Central Insurance Co. Ltd	13.45	21	26.95	21
Life Insurance Sector					
1	East West Life Assurance Company Ltd	152.67	1	553.121	3
2	New Jubilee Life Insurance Co. Ltd	150.622	2	14201.28	2
3	EFU Life Assurance Limited	143.041	3	18492.341	1

Table 2: Relationship of VA, VAIC™ and Performance Components of VAIC™ with Financial Performance Indicators

Dependent Independent	ROE			ROI			EPS		
	M1	M2	M3	M1	M2	M3	M1	M2	M3
Constant	-3.956	21.789	19.768	-12.398	6.333	-0.206	1.715	-0.407	-1.906
VA	0.434			0.219			0.810		
VAIC™		0.827			0.531			0.030**	
HCE			0.461			0.175			0.004*
SCE			0.495			0.818			0.071***
CEE			0.526			0.076***			0.855
R <sup>2</sup>	0.191	0.186	0.216	0.310	0.302	0.360	0.511	0.535	0.554
Adj. R <sup>2</sup>	-0.013	-0.020	-0.004	0.134	0.124	0.179	0.388	0.417	0.430
F-statistic	0.934	0.905	0.983	1.763	1.696	1.991	4.142	4.550	4.449
Prob. (F-stat)	0.557	0.594	0.498	0.029**	0.038**	0.009*	0.000*	0.000*	0.000*
Coefficients	5.297	1.812	6.656	4.391	2.750	6.322	-0.075	0.820	1.186
			4.875			0.848			-0.582
			-5.203			-7.525			-0.067
T-statistic	0.786	0.219	0.741	0.219	0.629	1.366	-0.241	2.201	2.946
			0.685			0.231			-1.825
			-0.637			-1.789			-0.183
Durbin-Watson	2.620	2.616	2.677	2.381	2.359	2.490	1.983	2.052	2.077

\*, \*\* and \*\*\* show significance level at 1%, 5% and 10% respectively.

Table 2 represents empirical results of three proposed models M1 for ROE, ROI and EPS. The proposed model M1 for ROE, ROI and EPS shows the empirical relationship of VA and financial performance indicators. The results presented in Table 2 show that VA has positive relationship with ROE ( $\beta = 5.296662$ ) and ROI ( $\beta = 4.390937$ ) and a negative relationship with EPS ( $\beta = -0.075028$ ). But these relationship are not statistical significant. The F-test represents overall the fitness of the model [30-32]

The F-Prob. shows that this model is significant for EPS at ( $P < 0.01$ ) and for ROI at ( $P < 0.05$ ) but it is not significant for ROE. Each insurance company has different portfolio of gross premium and operating expenses (excluding person cost) which influence the financial returns of insurance sector in different dimensions over the period of 2006 to 2010 [33-36].

The proposed model M2 for ROE, ROI and EPS demonstrates the empirical results of VAIC<sup>TM</sup> with financial performance indicators. The results show that VAIC<sup>TM</sup> has positive and significant relationship with profitability at ( $P < 0.05$ ) whereas it has only positive relationship with other financial performance indicators but they are not significant. F-Prob. represents that this model is also significant for ROI at ( $P < 0.05$ ) and for EPS at ( $P < 0.01$ ).

The proposed model M3 for ROE, ROI and EPS reveals the empirical relationship of performance components of VAIC<sup>TM</sup> (*i.e.* HCE, SCE and CEE) with financial performance indicators. The empirical relationship demonstrates that Capital Employed Efficiency (CEE) has a negative and significant relationship with financial performance (ROI) at ( $P < 0.1$ ). The reason might be that each insurance company has different size and portfolio of financial and physical assets. Human Capital Efficiency (HCE) and Structural Capital Efficiency (SCE) have positive and significant relationship with financial performance indicators. The proposed model M3 for EPS contributes 54% positive variation in profitability where HCE has most significant relationship with profitability.

### CONCLUSION

The present study is an attempt to examine the empirical performance of IC through VA, VAIC<sup>TM</sup> models and components of VAIC<sup>TM</sup> and its relationship with financial performance indicators. This study has exposed the following empirical relationship with financial performance indicators of insurance sector.

- A positive relationship of VA and financial performance indicators (ROE and ROI).
- A positive and significant relationship of VAIC<sup>TM</sup> with profitability (EPS) at ( $P < 0.05$ ). However, VAIC<sup>TM</sup> has also positive relationship with other financial performance indicators (ROE and EPS) but they are not significant.
- A positive and significant relationship of Human Capital Efficiency (HCE) with profitability (EPS) at ( $P < 0.01$ ). Whereas a negative and significant relationship is examined between SCE and EPS.
- A negative and significant relationship between CEE and ROI whereas, only positive relationship is examined between HCE and SCE with ROE.

The results of the study are consistent with other studies conducted on the subject matter in different countries. The results reveal that future performance of a firm depends upon its intellectual capital efficiency. Furthermore, the study provides pragmatic evidence regarding the involvement of IC in insurance company's current and future performance. HCE contributes more as compared to SCE and CEE in IC performance of insurance sector. This indicates that investment in human capital is more productive as compared to other components of VAIC<sup>TM</sup>.

The major drawback of this study is related to VAIC<sup>TM</sup> approach. There is a growing criticism on VAIC<sup>TM</sup> approach over time which indicates that the estimates obtained through VAIC<sup>TM</sup> approach are not close to the reality to some extent and suffer from estimation defects. It is left on the shoulders of the future readers to use other approach for estimation after making it free from estimation defects.

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