IMPACT OF INTELLECTUAL CAPITAL ON CORPORATE FINANCIAL PERFORMANCE: AN EMPIRICAL EVIDENCE FROM PHARMACEUTICAL SECTOR OF PAKISTAN

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Abstract

The basic purpose of this study is to analyze the impact of intellectual capital on corporate financial performance. This study is conducted on pharmaceutical sector listed in Pakistan Stock Exchange. Data for this study was collected from audited annual financial statements of selected business organizations over period of ten year i.e. from 2005-2014. Value Added Intellectual Coefficient

(VAIC) methodology is employed, in order to measure IC (Intellectual Capital) and its different components. The firm's financial performance is measured by using profitability measures including ROE (Return on Equity) and ROA (Return on Assets), market to book value and asset turnover. In order to analyze the collected data, the Partial Least Square (PLS), a SEM (structural equation modeling) technique. These approaches are used to assess the measurement and structural models. The results of analysis have supported the proposed hypothesis i.e. there is significant positive impact of intellectual capital on firm's financial performance among pharmaceutical industries of Pakistan.

***Keywords*:** intellectual capital, VAIC, partial least square, financial performance, pharmaceutical firms

Introduction

The application and the conceptual framework of Intellectual Capital have gained significant attention and efforts from academicians, researchers and practitioners. During start of 21st century, the concept of intellectual capital gained significance as key source of firm's competitiveness. During modern business world, large number of organizations specifically those which are dealing in knowledge and high technology are based on the intellectual capital (Khalique et al., 2012)

Similarly, Davenport and Prusak, (1998) mentioned that the economic enterprises are being converted on knowledge based enterprises and are mainly technology driven. Canibanoet. al. (2000) insisted that the information, knowledge and experiences etc., combine to form the intellectual capital, constituting the foundation of success and performance in modern era. These intangible resources of any business organization are considered as base for attaining and sustaining the competitiveness of business organization. Maditinoset. al., (2011) insisted that the traditional accounting procedures and reports are unable to show the true value of intangible assets that business organization has developed, unable of covering the gaps between book value and market value of modern business organizations.

The intellectual capital of business organizations is considered and referred as firm's hidden value facilitating them to achieve the competitive advantage (Bismut and Tojo, 2008; Edvinsson and Malone, 1997; Chen et. al., 2005). In order to assess and measure intellectual capital's value for an organization, the managers of business organizations are considered as potential strategic assets (Kamath et. al., 2007). The firm's stakeholders, as include the government, employees, customers,

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investors and shareholders, are using simple appraisal evaluation of firm's statement are unable to suffice as the financial statements are just showing the accountant's perspective toward performance of the business organization. Different research studies for instance including Bontis, (2001), Edvinsson, (1997) and Sveiby, (2010) are agreed on the fact that conventional measures of traditional financial statements of business organizations are not enough for evaluating the performance of business organizations specifically knowledge based organizations.

Several previously conducted studies for instance including Chan et. al., (2009); Kamath, (2008); Stewart (1997); Maditinoset. al., (2011) and others in this regards have investigated and tried to identify different ways of measuring value of firm's intellectual capital and apprising the relationship among constructs and with the firm's overall performance. It has been identified that there are few and limited work, focusing on this approach and use of this approach has provided the efficacious findings and results specifically for the developing economies like Pakistan. The measurement, reporting, analysis and disclosure, all are at initial and primitive stage in such countries/economies (Kamath, 2008).

Pharmaceutical sector is developing, producing and marketing the pharmaceutical and drugs, to be used in medication. The pharmaceutical firms are dealing in brand medications, generic medications, medical and surgery devices and instruments and others. The pharmaceutical business organizations are considered as most important technology driven and knowledge based or intensive business organizations, and therefore are considered as great source of IC (Intellectual Capital).(Daum et. al., 2005).

Literature Review

The Cabrita and Vaz (2008), defined that the intellectual capital as the matter of creation, development and is supporting connection between sets of different expertise, competence and experience outside and within the business organization. Similarly, another study conducted by Mention and Bontis (2013) which include data from 200 different organizations in Luxembourg and Belgium and investigated the ways in which IC (intellectual capital) is associated and related with firm's overall organizational performance. Results of study identified significant influence and impact of intellectual capital and firm's financial performance and mentioned that there is direct and indirect, both, relationships between constructs. The relational and structural capital was found positively correlated with the performance of organization. The results of this study also identified that there exist insignificant relations.

Mavridis (2004) on the other hand found that among banks in Japan, the effective and efficient utilization of human capital is significantly positively correlation with the banks' financial performance. The study also identified that the efficient performance of human capital is more important with the efficient utilization of physical capital. The study conducted by Ahangar (2011) examined and investigated impact of intellectual capital efficiency and firm's overall performance and their performance and for this corporate sector of Iran was selected. In this study the author used VAIC model for determining and measuring the intellectual capital efficiency while the firm's performance was measured by using profitability, growth in sales and the employee performance and productivity. The study identified that the human capital among corporate sector of Iran is most important for their performance and identified direct relationship between firm's performance and all the three components of the intellectual capital. This study additionally identified that all the three dimensions proposed in VAIC model are significantly explaining profitability of business organizations, investigated.

The studies identified, reviewed and described above are mainly conducted in developing economies and countries which have shown that there is still need to identify and investigate how intellectual capital impact the firm's overall financial performance. Additionally, the studies conducted in context of Pakistan are quite limited therefore there is still room to study and identify how intellectual capital influences the financial performance of business organizations specifically within the Pakistan.

Sharabatiet. al., (2010) organized and conducted study to identify the relationship between corporate performance and the intellectual capital among pharmaceutical industry of Jordan and identified that the IC (Intellectual Capital) has statistically significant and positive relationship on the firm's financial performance in Jordan pharmaceutical business organizations. Similarly, the Chen (2010) identified and argued that firm's intellectual capital is having strong positive influence on firm's overall financial performance. Similarly, the study conducted by Khalique ET. al., (2011) identified that the intellectual capital is playing important role in increasing the firm's performance. Chen et. al., (2005) mentioned the intellectual capital as core competency for the enhancement of firm's profit and innovation. The Sharabatiet. al., (2010) mentioned that the intellectual capital and firm's performance studies are showing mixed results and trends.

Hypothesis Formulation

Different researches, as identified earlier have been conducted is different geographical areas and industries, identified and studied the impact of intellectual capital on the performance of business organizations. Commonly focused industries among these studies as found include banking industries and financial institutions. The hypothesis below is developed based on the identified relationships in these studies for instance Young et. al., (2009); Mavridis, (2004); Joshi et. al., (2010); Gignate and Previati, (2013); Abdulsalamet. al., (2011); Shiu, (2006); Chang and Hsieh, (2011); Kamath, (2008); Pal and Soriya, (2012); Mehralianet. al., (2012) and others.

Based on the relationship identified from mentioned studies, the hypothesis is developed and summarized as under.

H1: Keeping all other factors and aspects constant, the business organizations with greater intellectual capital are subject to better financial performance.

Research Methodology

Data collected in this study is taken from all the nine pharmaceutical firms through secondary data sources. The data in this regards is mainly collected from the audited and published financial reports of organizations selected from pharmaceutical industry. The data is collected for last ten years i.e. from 2005 to 2014.

Subject study is therefore aimed to investigate the relationship between and impact of intellectual capital on firm's financial performance in pharmaceutical sector of Pakistan. All the firms listed in KSE and operating in pharmaceutical sector are population of this study. Since population is small i.e. there are only nine firms in pharmaceutical sector of Pakistan and data is collected from whole population, therefore sample of this study is comprised of all the nine firms in pharmaceutical sector of Pakistan. Therefore, this study is done on total population sampling design which is a type of purposive sampling, and is considered as non-probability sampling.

PLS graph 3.00 was applied in order to investigate the impact of dependent variable on the independent variable. The partial least square technique under the structural equal modeling technique in this regards is used to manage available small set of data (Sharabati et al., 2010).

Measuring Independent Variable

The VAIC methodology, which is used in subject study and this model, was first developed and formulated by the Public (1998). Core idea under the value added intellectual capital approach is that the human capital in the organization is responsible for the firm's overall financial performance and efficiency of business organization. VAIC (Value Added Intellectual Capital) is calculated on the basis of five different calculations, summarized as under.

i. **VA = OUT – IN**

In this equation, VA refers to the value addition by using resources of current year.

"Out"= all the revenues i.e. Total Sales

"In" = cost of services, components and materials.

Another approach that can be used alternatively for calculating the 'Value Added' is:

VA = OP + EC + D + A

Where the 'OP' refers to the Operating Profit, 'EC' shows the Employee Cost, 'D' represents 'Depreciation', and the 'A' is representing 'Amortization'.

ii. **CEE = VA/CA**

CEE=Capital Employed Efficiency

VA= Value Added

CA= Capital Employed which is calculated based on net book value of total assets.

iii. **HCE = VA/HC**

HCE is representing firm's 'Human Capital Efficiency'. HC is combination of total salaries and wages of direct labor and indirect labor, administrative and selling expenses and market expenses.

iv. **SCE = ST/VA**

SCE = Structural Capital Efficiency while the ST is calculated by using equation below.

ST = VA – HC

v. **VAIC = CEE + HCE + SCE**

Finally, the VAIC (Value Added Intellectual Capital) coefficient is calculated by adding CEE, HCE and SCE.

Measurement of Dependent Variables

Following ratios are used to measure the dependent variables:

ROA = Earnings before Interest and Tax / Total Assets' Book Value

ATO = Total Sales / Total Assets' Book Value

MB = Market Capitalization / Common Stock's Book Value

ROE = Net Income / Total Shareholder's Equity

Structural Equation

Structural equations are used to develop research model of this study that connected intellectual capital efficiency and financial performance.

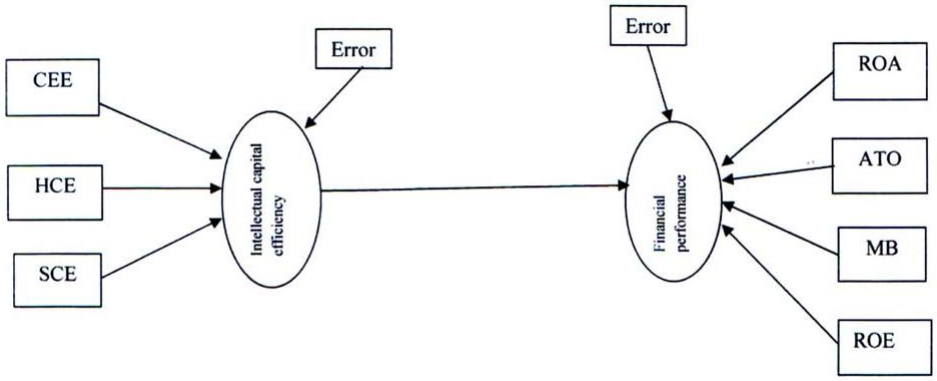

FIG.1 STRUCTURAL LINKS BETWEEN IC EFFICIENCY AND FINANCIAL PERFORMANCE

In figure, all indicators are shown is squares and all latent constructs are shown in circles. All indicators influence their respective latent constructs. In mathematical terms, latent constructs can be measured as follows:

$$\xi = \gamma x1X1 + \gamma x2X2 + \gamma x3X3$$

$$\eta = \gamma y1Y1 + \gamma x2X2 + \gamma x3X3 + \gamma x4X4$$

The hypothesis, impact of latent exogenous variables, IC efficiency (ξ) on latent endogenous variables, financial performance would be measured through:

$$\eta = \beta 1\ \xi 1 + \zeta \qquad \text{(H1)}$$

Proxy measures used in structural equation are given in table:

Table: 1. Details of Exogenous and Endogenous Variables and Symbols

No	Symbol	Abbreviation	Description
1	Ξ	IC	Latent Exogenous Variable, Intellectual Capital Efficiency Measures
2	H	FP	Latent Endogenous Variable, Financial Performance
3	Z		Random Disturbance Term
4	γx1	CEE	Path coefficient of X1, Capital Employed Efficiency
5	γx2	HCE	Path coefficient of X2, Human Capital Efficiency
6	γx3	SCE	Path coefficient of X3, Structural Capital Efficiency
7	γy1	ROA	Path coefficient of Y1, Return on Assets
8	γy2	ATO	Path coefficient of Y2, Asset Turnover
9	γy3	MB	Path coefficient of Y3, Market to Book Value
10	γy4	ROE	Path coefficient of Y4, Return on Equity

Finally, structural model measuring the impact of IC on FP is shown in Fig. 2 IC efficiency is measured by VAIC model and financial performance is multiple of ROA, ATO, MB and ROE.

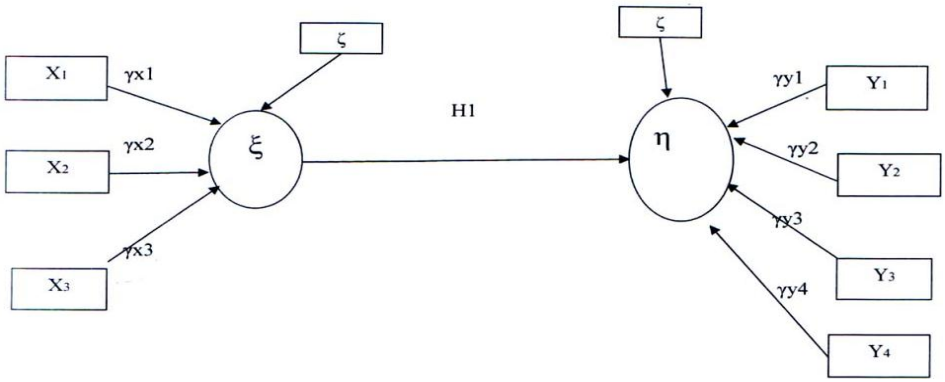

FIG: 2 STRUCTURAL MODEL MEASURING THE IMPACT OF IC EFFICIENCY ON FINANCIAL PERFORMANCE

Data Analysis and Interpretation:

This study is aimed to investigate and interpret impact of intellectual capital on firms' financial performance. For this purpose, a detailed analysis on pharmaceutical firms has been done and its interpretation is given below.

Descriptive Statistics

Table: 2 Descriptive Statistics (2005-2014)

Construct Name	Indicator Code	N	Minimum	Maximum	Mean	S.D.
Intellectual Capital	CEE	87	-.0900	1.8607	0.637102	0.2650592
	HCE	87	-1.5093	5.4633	2.233208	0.9079312
	SCE	87	-.9417	1.6625	0.511527	0.2553598
Financial Performance	ROA	87	-14.0897	50.9711	16.985909	10.6548902
	ATO	87	62.9239	195.5663	133.511981	35.0037572
	MB	87	7.9743	639.9774	228.172200	139.1263853
	ROE	87	-68.8511	40.0463	16.474011	13.1953441

Descriptive statistics are shown in the above given table. Arithmetic mean is used as a measure of central tendency due to less extreme observations in data. Standard variation is used as a measure of variation. Table 2shows the maximum, minimum, average and standard deviation, calculated for all the independent and dependent variables during year 2005 to 2014. The mean value of HCE component is 2.233208 is considerably greater than rest of two components i.e. CEE and SCE. It shows that HCE has greater contribution towards IC efficiency. The mean value of ROA and ROE are showing almost same mean value. The standard deviation of HCE is also greater than other independent components.

Partial Least Square Analysis:

Partial least square analysis examines data, and based on the analysis, the estimates path coefficient (β), along with R-Square i.e. coefficient of determination (R^2) were determined. Additionally, the predictive relevance (Q^2) was calculated and for this PLS Graph Version 3.0 was used. All

constructs taken and used in this study were taken as formative instead considered as reflective. It is important for research to differentiate reflective constructs from formative constructs. Indeed, poor differentiation of constructs reduces the quality of the measurement model and quality of the structural model (MacKenzie et al. 2005). PLS Graph based results are interpreted in two steps:

a. Measurement model (outer models)

b. Structural model (inner model)

In order to prove the model's validity, suitable technique used was bootstrapping, aimed to attain the significance of individual indicator. The weights and significance for every independent and dependent indicator has been summarized in table from 3 to 13.

Table: 3Validity Test for Indicator (2014)

Construct Name	**Code**	**Item Weight**	**t – value**
Intellectual Capital	CEE	0.361	1.8413*
	HCE	0.391	6.7480***
	SCE	0.489	6.2029***
Financial Performance	ROA	0.406	3.8096***
	ATO	0.208	2.3727**
	MB	0.184	3.1754***
	ROE	0.405	9.0151***

* Significance value for (10%) is 1.645

** Significance value for 5% is 1.96

*** Significance value for 1% is 2.576

TABLE: 4 Validity Test forIndicator 2013

Construct Name	**Code**	**Item Weight**	**t – value**
Intellectual Capital	CEE	-0.018	0.0739
	HCE	0.487	12.0336***
	SCE	0.523	11.5273***
Financial Performance	ROA	0.480	6.7529***
	ATO	-0.103	0.6246
	MB	-0.212	1.2306
	ROE	0.484	7.4002***

* Significance value for (10%) is 1.645
** Significance value for 5% is 1.96
*** Significance value for 1% is 2.576

Table: 5 Validity Test for Indicator 2012

Construct Name	Code	Item Weight	t – value
Intellectual Capital	CEE	0.282	1.6351
	HCE	0.451	6.0206***
	SCE	0.555	8.0068***
Financial Performance	ROA	0.545	10.4736***
	ATO	0.219	2.3224**
	MB	0.255	6.1331***
	ROE	0.509	7.3576***

* Significance value for (10%) is 1.645
** Significance value for 5% is 1.96
*** Significance value for 1% is 2.576

Table: 6 Validity Test for Indicator 2011

Construct Name	Code	Item Weight	t – value
Intellectual Capital	CEE	-0.344	1.8640*
	HCE	0.377	4.5033***
	SCE	0.477	4.3000***
Financial Performance	ROA	0.258	1.1552
	ATO	-0.707	2.6944***
	MB	0.126	1.4754
	ROE	0.402	3.6275***

* Significance value for (10%) is 1.645
** Significance value for 5% is 1.96
*** Significance value for 1% is 2.576

Table: 7 Validity Test for Indicator 2010

Construct Name	Code	Item Weight	t – value
Intellectual Capital	CEE	0.030	0.1218
	HCE	0.467	7.1225***
	SCE	0.560	4.5529***

Financial Performance	ROA	0.804	2.1867**
	ATO	-0.405	0.7016
	MB	-.0001	0.0006
	ROE	0.237	1.1652

* Significance value for (10%) is 1.645
** Significance value for 5% is 1.96
*** Significance value for 1% is 2.576

Table: 8 Validity Test for Indicator 2009

Construct Name	**Code**	**Item Weight**	**t – value**
Intellectual Capital	CEE	0.278	3.4790***
	HCE	0.562	2.8916***
	SCE	-0.341	15.0461***
Financial Performance	ROA	0.574	14.4538***
	ATO	0.099	1.0045
	MB	0.115	2.4390**
	ROE	0.414	20.6021***

* Significance value for (10%) is 1.645
** Significance value for 5% is 1.96
*** Significance value for 1% is 2.576

Table: 9 Validity Test for Indicator 2008

Construct Name	**Code**	**Item Weight**	**t – value**
Intellectual Capital	CEE	-0.272	5.3054***
	HCE	0.302	6.2438***
	SCE	0.497	16.8678***
Financial Performance	ROA	0.854	4.3600***
	ATO	-0.042	0.3127
	MB	-0.189	1.0036
	ROE	0.228	2.7119***

* Significance value for (10%) is 1.645
** Significance value for 5% is 1.96
*** Significance value for 1% is 2.576

Table: 10 Validity Test for Indicator 2007

Construct Name	Code	Item Weight	t – value
Intellectual Capital	CEE	-0.154	1.0897
	HCE	0.468	9.5716***
	SCE	0.453	10.0680***
Financial Performance	ROA	0.360	9.5953***
	ATO	-0.154	1.0334
	MB	0.366	3.8642***
	ROE	0.315	6.8794***

* Significance value for (10%) is 1.645
** Significance value for 5% is 1.96
*** Significance value for 1% is 2.576

Table: 11 Validity Test for Indicator 2006

Construct Name	Code	Item Weight	t – value
Intellectual Capital	CEE	-0.308	9.4573***
	HCE	0.386	13.6828***
	SCE	0.359	15.0568***
Financial Performance	ROA	0.299	4.6089***
	ATO	-0.261	3.3198***
	MB	0.351	9.4311***
	ROE	0.317	7.3330***

* Significance value for (10%) is 1.645
** Significance value for 5% is 1.96
*** Significance value for 1% is 2.576

Table: 12 Validity Test for Indicator 2005

Construct Name	Code	Item Weight	t – value
Intellectual Capital	CEE	0.127	0.5811
	HCE	0.510	10.7900***
	SCE	.0519	10.6639***
	ROA	0.383	10.4487***

Financial Performance	ATO	-0.035	0.2103
	MB	0.342	9.2891***
	ROE	0.304	4.4884***

* Significance value for (10%) is 1.645
** Significance value for 5% is 1.96
*** Significance value for 1% is 2.576

TABLE: 13 Validity Test forIndicators(2005-2014)

Construct Name	**Code**	**Item Weight**	**t – value**
Intellectual Capital	CEE	0.571	3.636***
	HCE	0.593	1.303
	SCE	0.509	1.438
Financial Performance	ROA	0.703	2.654***
	ATO	0.047	0.379
	MB	-0.282	3.603***
	ROE	0.388	1.406

* Significance value for (10%) is 1.645
** Significance value for 5% is 1.96
*** Significance value for 1% is 2.576

Weights during course of analysis are determined and calculated by using bootstrapping technique by using PLS Graph version 3.0 shown in the above tables showed that how every individual indicator is contributing towards individual emergent construct. Similarly, for the intellectual capital, the SCE and HCE have greater contribution towards capturing IC in ten years period 2005-2014. HCE remains significant in all ten years (2014-2005). It can be seen in the above given tables that financial performance construct is best contributed by return on assets. In combined data of ten years, CEE shows significant impact at 1% level and financial performance indicators are best explained by ROA and MB. Both of these indicators are significant at 1%.

The reliability test conducted for all the formative indictors, and for this the multicollinearity test was used (Andreev et al. 2009). Similarly, while considering arguments of Thongranttana (2010) and Andreev et. al., (2009), the multicollinearity test was used and conducted to assess the reliability of formative indicators. The VIF (Variance Inflationary Factor) is most commonly used method of checking reliability. The higher value of collinearity among different indicators would be resulted into unstable estimates, would be resulted into difficulty of evaluating roles of indicators toward formation of relevant construct. This is main reasons behind performing collinearity test, conducted by using SPSS (Statistical Package for Social Sciences), and calculated VIF. The results of calculated VIF shown that VIF is less than ten for time period analyzed, shown that there is no independent indicator that is explained by the other independent factors. Similarly, VIF value as is less than 10 is not creating multicollinearity problem (Kleinbaum et al. 1988. VIF results for independent indicators are given in table 14.

TABLE: 14 Indicator Reliability Test 2005 - 2014

Variable Name	Code	Average	SD	VIF
Intellectual Capital	CEE	0.672125	0.1812500	1.046
	HCE	2.530341	0.7566696	1.187
	SCE	0.571951	0.1279787	1.233
Financial Performance	ROA	22.685753	10.7946000	-
	ATO	124.338051	17.1931200	-
	MB	266.946105	90.3898747	-
	ROE	24.103077	8.7841353	-

After confirming the quality of measurement model by using reliability and validity tests, the quality for structural model is assessed and calculated by determining and calculating significance among constructs i.e. (β). Additionally, the goodness of fit by using R-Square and Q-Square i.e. predictive power model is used. Applying the structural equation model is suitable for analysis by using PLS (Partial Least Square), for determining the impact of different exogenous factors on different endogenous factors. The figures 3-13 are showing results of strcutural model, also including weights, path coefficients and R-square i.e. coefficent of determination by using partial least sqaure through strcutual eqaution modeling.

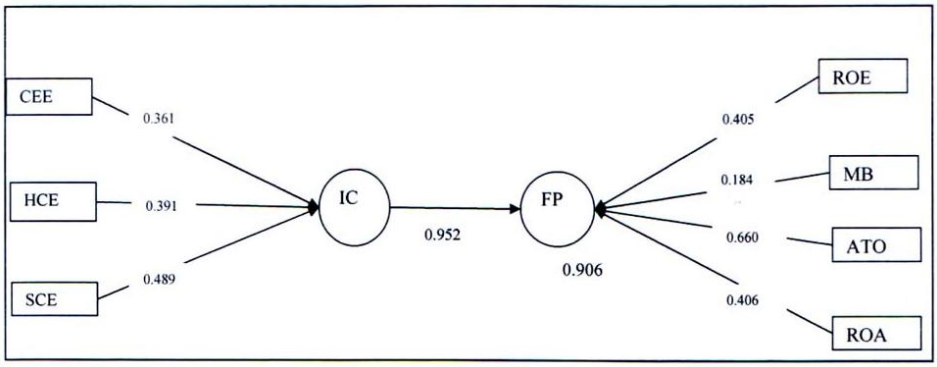

FIG: 3 STRUCTURAL EQUATION MODEL RESULTS (2014)

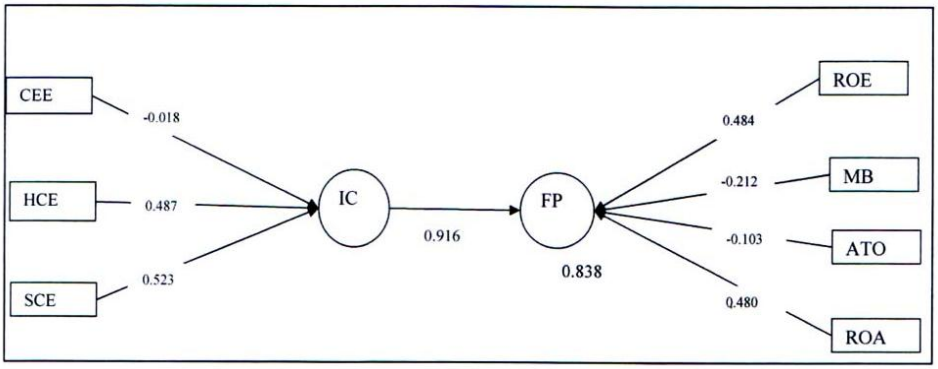

FIG:4 STRUCTURAL EQUATION MODEL RESULTS (2013)

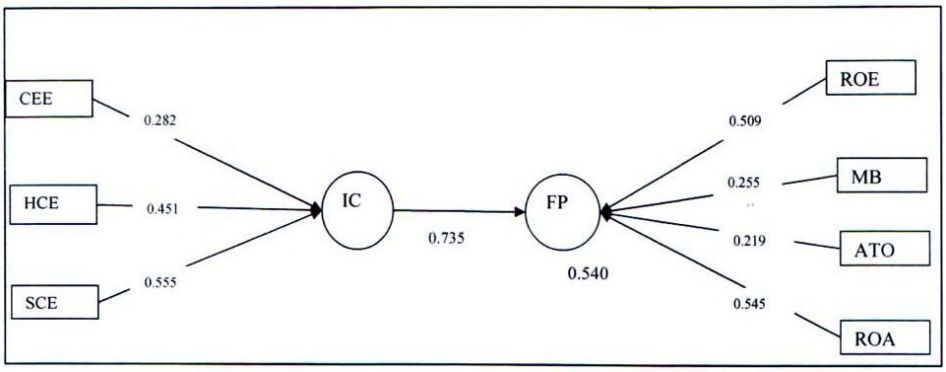

FIG: 5 STRUCTURAL EQUATION MODEL RESULTS (2012)

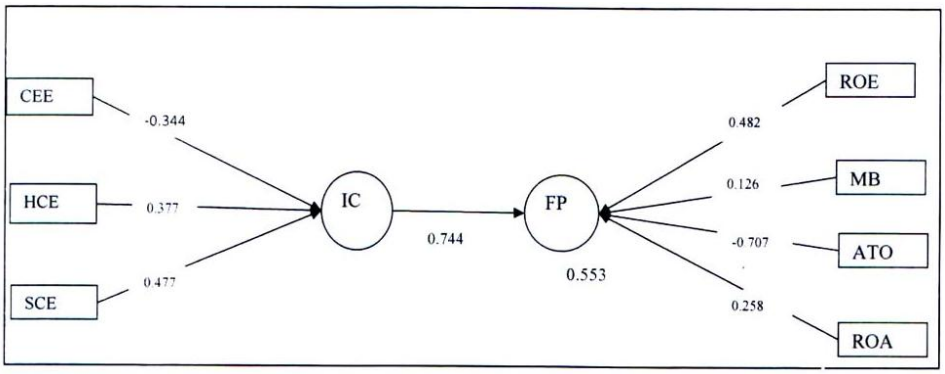

FIG: 6 STRUCTURAL EQUATION MODEL RESULTS (2011)

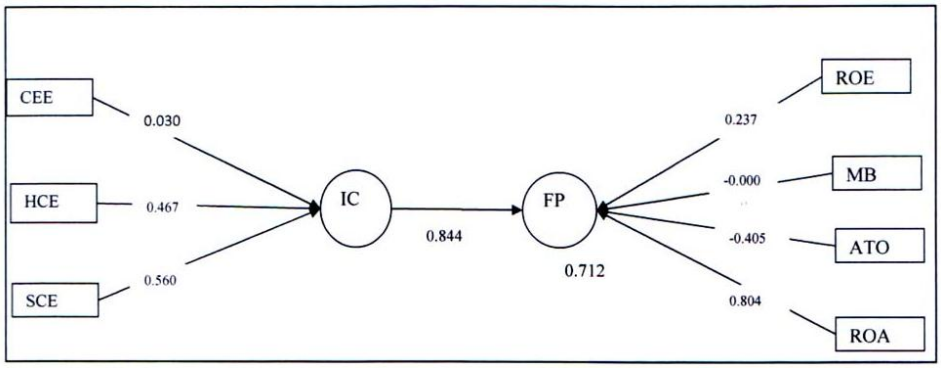

FIG:7 STRUCTURAL EQUATION MODEL RESULTS (2010)

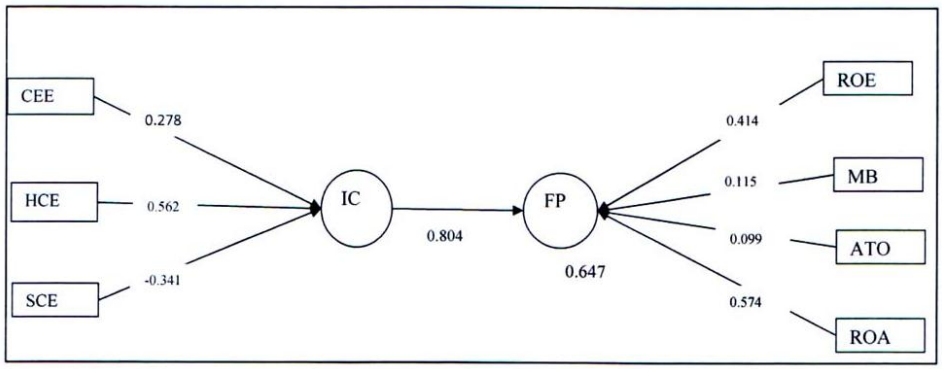

FIG:8 STRUCTURAL EQUATION MODEL RESULTS (2009)

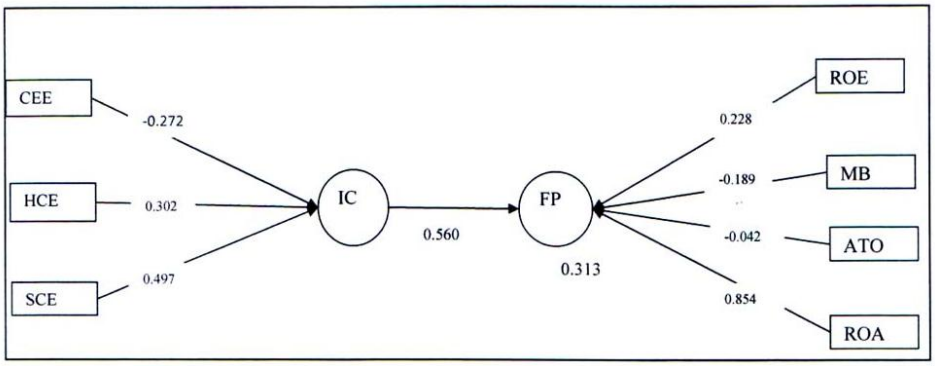

FIG:9 STRUCTURAL EQUATION MODEL RESULTS (2008)

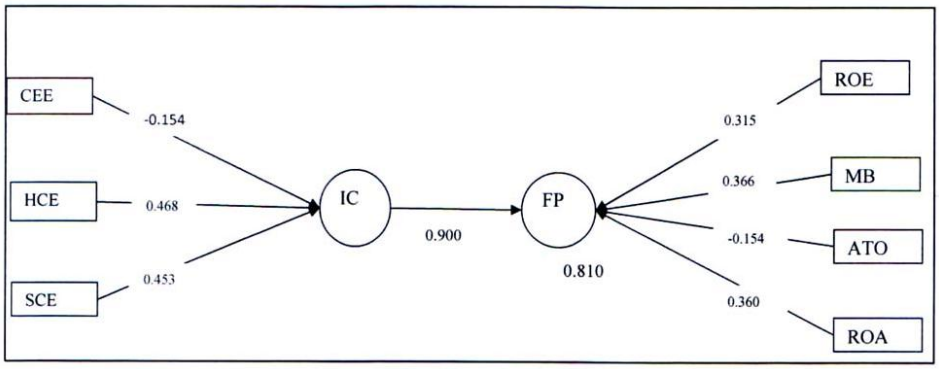

FIG: 10 STRUCTURAL EQUATION MODEL RESULTS (2007)

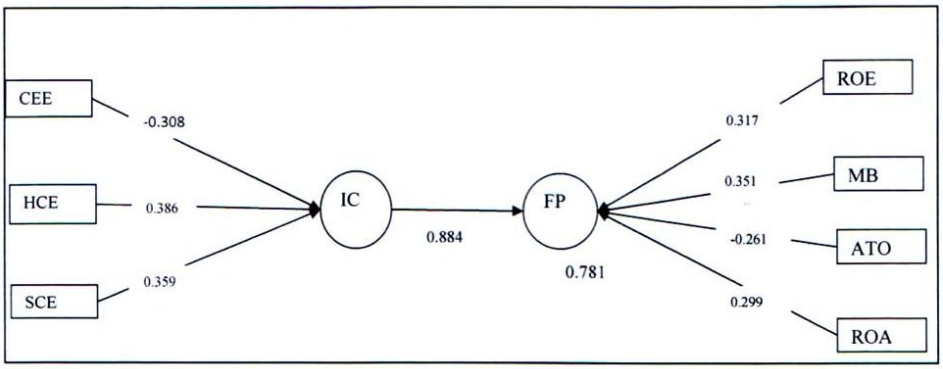

FIG:11 STRUCTURAL EQUATION MODEL RESULTS (2006)

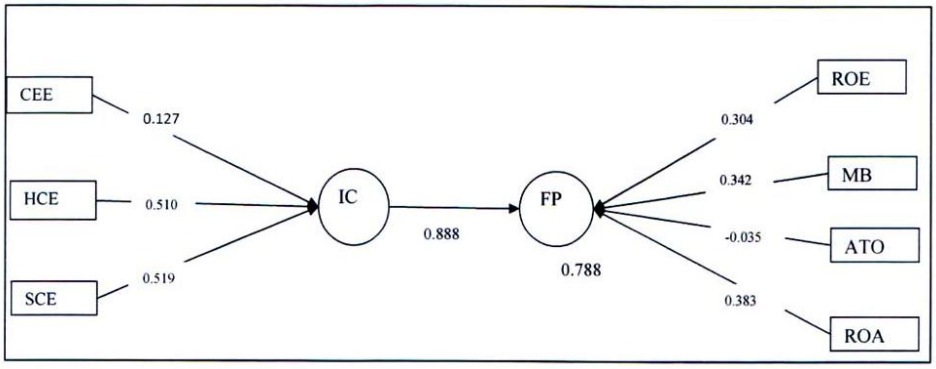

FIG:12 STRUCTURAL EQUATION MODEL RESULTS (2005)

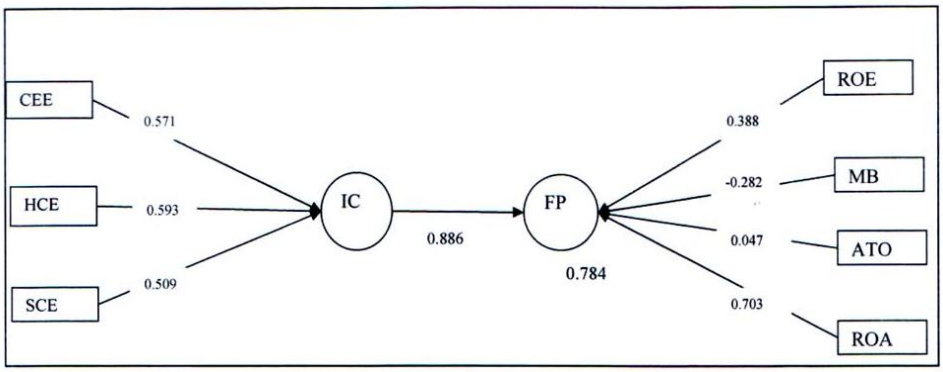

FIG: 13 STRUCTURAL EQUATION MODEL RESULTS (2005-2014)

Path coefficients (β) are calculated by using bootstrapping method in PLS graph v.3.0.

Table: 15 Path Coefficients of IC and FP

Years	Coefficients	t-value	Significance
2014	0.952***	5.1896	p<0.05
2013	0.916***	12.9273	p<0.01
2012	0.735***	17.5377	p<0.01
2011	0.744***	3.2490	p<0.10
2010	0.844	1.0105	p>0.10
2009	0.804***	37.0531	p<0.01
2008	0.560***	3.9867	p<0.10
2007	0.900***	33.3863	p<0.05
2006	0.884***	16.6560	p<0.05
2005	0.888***	23.6554	p<0.05
2005-2014	0.886***	26.161	p<0.05

* Significance value at 10% is 1.645
** Significance value at 5% is 1.96
*** Significance value at 1% is 2.576

Above results show that IC has significant impact on FP in nine out of ten years. ($\beta = 0.952$, t-value = 5.1896, $p<0.05$, $\beta=0.916$, t-value = 12.9273, $p<0.01$, $\beta = 0.735$, t-value = 17.5377, $p<0.01$, $\beta = 0.744$, t-value = 3.2490, $p<0.10$, $\beta = 0.804$, t-value =37.0531, $p<0.01$, $\beta = 0.560$, t-value = 3.9867, $p<0.10$, $\beta = 0.900$, t-value = 33.3863, $p<0.05$, $\beta = 0.884$, t-value = 16.6560, $p<0.05$, $\beta = 0.888$, t-value = 23.6554, $p<0.05$).). The pool data shows that IC has strong significant impact on FP ($\beta = 0.886$, t-value = 26.161, $p<0.01$). In this way, it can be concluded that IC has significant positive impact on financial performance.

R square is measuring proportion of variation in the endogenous construct explained by exogenous construct. R^2 values of the FP explained by IC measures remain high (90.6%, 83.8%, 54%, 55.3%, 71.2%, 64.7%, 31.3%, 81%, 78.1%, 78.8%) over the ten year period. All the models used are demonstrating efficient power of explanation as value of R-square for dependent construct i.e. the firm's financial performance is explained by IC range from 31.3% to 91.3%. The categories of R-Square identified and summarized by Cohen (1998) summarized small at 10% while medium and large at 25% and 36% respectively. The value of R-Square calculated in this study are all far above than the large effect size i.e. 36%. In this study all values of Q^2 remain greater than zero from 2014-2005 identified that the model is having good predictive power. This means that higher Q^2 value leads to higher predictive relevance of the model. Additionally, if determined valued are closer to the zero, showing that predictive power is within the recommended threshold.

Conclusion

This study was conducted to conclude the impact that intellectual capital and different components of intellectual capital have on financial performance of business organizations empirically. Path coefficients calculated, confirmed that there is statistically significant positive correlation, IC have with the FP measures. The hypotheses developed and analyzed have been evaluated by using Stone Geisser test (Q^2) and coefficient of determination (R^2).

It is clear that H1 is accepted. Acceptance of H1 is consistent with the results of literature (Goh, 2005; Yalama, 2007; Firer and William, 2003; NikMaheran*et al.* 2009).

Future Research

Future research may be conducted based on expanded population and sample size and consider more sectors listed in stock exchange of Pakistan. More researches on emerging economies are required to increase the generalizability of this model of measuring impact of IC on FP. Most of the researcher across the border have used VAIC (Value Added Intellectual Capital) model in order to measure the intellectual capital efficiency and considered it very helpful. Until the intellectual capital components and intellectual capital models are not confirmed and finalized, therefore there should be conducted more research studies, based on widely accepted VAIC model. The research in future may explore the measures for intellectual capital comprehensively as well as also develop new models for intellectual capital for assessing the performance of intellectual capital for business organizations. In future, comparative studies between two or more sectors have to be conducted to have better understanding towards impact of intellectual capital.

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