



Impact of Intellectual Capital on Firm Performance

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ABSTRACT

For the better performance in the business, significance of Intellectual Capital (IC) has got world glance. Current study analysis is primarily based on the investigating the impact of intellectual capital on the overall financial performance and financial efficiency of manufacturing firms in Pakistan. For this purpose, panel data regression analysis has been conducted to check the effect of major explanatory factors like human capital efficiency (HCE), structural capital efficiency (SCE), and capital employed efficiency (CEE) has been considered for the outcome factor. Intellectual capital is considered as major IV with three components of HCE, SCE, CEE while firm performance is considered through Return on the assets (ROA) of the business which is considered as major DV. The outcomes of the study reveal the fact that there exists the significant association between the various components of Intellectual Capital and the firm performance. The study will be very much beneficial for the various policy makers in considering the significance of intellectual capital in evaluating the financial performance of the business. However, among the key limitations, this study is not covering the other sectors like service industry in the same region of Pakistan. Therefore, adding some other sectors from Pakistan will provide some more meaningful results like the service industry to conduct the future research. Future studies can be carried while adding some more predictors like social capital and spiritual capital for the consideration of firm performance. In addition, cross sectional comparison in coming time will provide a comprehensive empirical evidence in present literature as well.

Keywords:

Intellectual Capital, Firm Performance, ROA, Pakistan

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Introduction

In contemporary environment, Business organizations have faced many challenges especially because of knowledge-based economy and globalization. Such competition generates a need for the new tool that has a competitive advantage for the product which are provided in the market. The new weapon in contemporary business is information that organization uses in the knowledge economy. Knowledge being new source of corporate development (Siltaoja, 2014). Successful companies rely more on skills and knowledge of the employees other than tangible assets. Intangible assets are more essential for enhancing the performance of the business. It is also an awareness age of intangible asset which includes knowledge, researches, trademark, customer relation and innovation which are more important than tangible assets (Nagaraja & Vinay, 2016).

Since 90's, knowledge becomes the most vital strategic economic source to achieve the competitive advantage for the business firms as stated by Gavius and Russ (2009). The lack of knowledge and experience is a key reason for the failure of the business (Matlay, 2005; Shepherd, Douglas, & Shanley, 2000). According to Stewart (2002), new economy stands on three pillars; awareness of market, knowledge base assets and strategies to explain them. The knowledge-based economy supports that business which mainly relies on wealth creation, through improvement, operation, and consumption of company's intangible assets or intellectual capital as stated by Dženopoljac, Janošević, and Bontis (2016).

While moving from traditional based company to knowledge based, it is very much significant to understand the core concept of intellectual capital or IC (Hussinki, Ritala, Vanhala, & Kianto, 2017; Inkinen, 2015; Montequín, Fernández, Cabal, & Gutierrez, 2006; Nawaz, Haniffa, & Hudaib, 2014; Wang, Wang, & Liang, 2014). IC is very crucial in knowledge base society (Gavius & Russ, 2009) Business growth has

several measures like through with both tangible and intangible assets, knowingly as IC (Xinyu, 2014). The organization for Economic Co-Operation and Development (OECD, 2008) mentioned that many organizations are investing more in training and human resource development program customer relation, research and development and technology based managerial system. Such investment enhanced the value of IC and competing physical capital.

In previous literature it is evident that the importance of IC as it represents more than 50% of total market value of some organization like Microsoft, Dell, Intel, Coca-Cola, Astra, Rentokil and Oracle. (Alcaniz, Gomez, & Roslender, 2011; Chang & Birkett, 2004; Clarke, Seng, & Whiting, 2011; Kim, Yoo, & Lee, 2011; Montequín, 2006; Ramezan, 2011; Wall, 2005).

The importance of intellectual capital is increased in the changing new knowledge base economy, where IC capital plays role for the continuity and existence of that organization. Many accounting problems for the measurement of IC are existed in the contemporary economy. For instance, international financial reporting standards and international accounting standards or IAS have not a proper participated for defining concepts and methods to measure and evaluate IC. This initiate an urgent need to find special standards to measure intellectual capital and improve it as decision makers has more need for information about intellectual capital, its costs and benefits. The current research seeks to expand the efforts done by other researchers to find the suitable measure for IC efficiency and its effect on the market, economic and financial performance by using Value Added Intellectual Capital (VAIC).

Various scholars have argued on the idea that intellectual capital enhances firm performance. Knowledge resources and intellectual resources are foundation of competitive advantage. Different areas find the significant relationship between IC and firm performance. In the world economy, Pakistan textile industry is playing its

vital role since last many years and it has major share from the context of global export. It is facing the high competitive advantage with the other export-oriented countries. But unfortunately, most of the labor is shifting to another country because of low salary, ineffective training and skills (HC) that effects the organization profit and also have low R&D (SC) (Alvi & Shahid, 2016). As per the scientific synthesis of (Iqbal, Shaikh, Mahmood, & Shafiq, 2010), textile has low investment in Information technology IT infrastructure (SC), lack of skills and training in labor (HC), and low level of Research & Development.

Moreover, Pakistan textile industry also facing the problem of innovations (Kazmi & Takala, 2014). Based on present analysis of textile sector of Pakistan, it is revealed that manufacturing of cotton is cheaper in India due to the availability of better quality value addition and replace their old machinery with the latest machinery, lower labor cost and better workforce were such indicators that strength the Indian industry but Pakistan facing these problems (Khan, 2016). Based on the problems, it is very much significant to address the stated issue in terms of effect of intellectual capital IC on the performance of textile sector of Pakistan.

The significance of the study can be explored as the present study is addressing the latest problem in the industry in the form of low performance and the role of IC. By addressing the latest issue, the findings of the study will not just cover the gap in the existing body of literature but also provide a framework which can help the management of textile sector. Both theoretical and practical significances are presented in the study.

Hypotheses

H1- Human capital efficiency or HCE has a positive and significant association with the firm performance of textile sector.

H2- Structural capital efficiency is positively and significantly related to the firm performance of textile sector.

H3- Capital employed efficiency is positively and significantly related to the firm performance of textile sector.

H4- Intellectual capital and return on assets is positively and significantly related to the firm performance of textile sector.

Literature Review

Various research studies have been conducted to define the role and impact of intellectual capital on the value of the firm. But the context of IC in terms of definition is very broad and various authors have defined key factors to explain the IC. For instance, Edvinsson and Malone (1997) defined IC as the concept of knowledge which can be source of value creation for the business organization over a life time. Their findings also provide the fact that there is significant difference in the both the market and book value of intellectual capital. While, Stewart (1997) views IC as knowledge, information, intellectual property, and expertise that can be used to create wealth. According to Bontis, Chua Chong Keow, and Richardson (2000) explain that for the sustainable competitive advantage, IC is purely the combination of organizational level of knowledge and individual level of knowledge of the workers of the business. In their view point, IC covers the human capital and its core dimensions. Whereas, Pulic (2000) explain that IC includes the core abilities of all employees who work for the value creation of the business. In the findings of Moore (1996) IC includes, the innovative capital, customer capital and level of organizational capital. Authors like Blair and Wallman describe that it is not possible to provide a concise and complete definition for the intellectual capital.

Baum and Silverman (2015) excessively considered the connection between Intellectual amount of capital and financial outcomes of 113 manufacturing firms working in the environment of Argentina. The consequences of the study appeared that there is a critical positive relationship between IC and financial outcomes for these firms over a period of time in which the

study is carried out. Ting and Lean (2009) examined the connection between IC and the financial performance of firms working in Malaysia. They connected the Value Added Intellectual Coefficient VAIC strategy keeping in mind the end goal to measure the empirical impact of intellectual amount of capital on return on assets (ROA). The consequences of this examination demonstrated that there is a significance linkage between the three parts of the IC and the financial outcomes of selected organization. Koryak (2015) contemplated the part of significant worth included – as a list for measuring Intellectual amount of capital – and its association with financial performance for the firm's working in UK. The aftereffects of their examination demonstrated the idea that there is a positive connection between IC and financial measures of the business over time span of the study. Besides, some studies have focused on the consideration of Corporate Governance and financial outcomes for the business with respect to the various factors of human and structure capital. Among the several indicators, most significant are of the human capital for the financial performance as stated in the findings of (Baum & Silverman, 2015; Becker, 1994; Cadbury, 1992; Coleman, 1988; Dzenopoljac, 2017; Gillies, 2017; Governance & Directors, 2002; Kalkan, Bozkurt, & Arman, 2014; Machlup, 2014; Mincer, 1974; Wang, 2014).

For the achievement of maximum efficiency over the assets and capital sources of the business, corporate governance is considered as among the major mechanism. It provides the sustainability, profitability and level of productivity with addressing the new challenges to the business. But to deal with the firm performance and the impact of IC on overall financial outcome of the business is among the major issue in CG. To get competitive advantage, it is under the title of CG to maximize the corporate value (Cadbury, 1992; Council, 2003; Governance & Directors, 2002).

Various researchers consider that it is the obligation of Board of Directors to look at the

efficiency level of human capital which is known as IC for the better performance of the business. Various studies have focused on the role of IC and performance of the firm from the perspective of roles and duties of the board members. For example, the research work of (Makki & Lodhi, 2014, 2009, 2008) and financial performance has been represented through equity, investment and other earnings indicators. In their study, Amir and Lev (1996) have worked on various insurance companies by considering the impact of intellectual capital and its impact on the performance of the business firm. By using the M/B book ratio, their major concern is to study the impact of human capital on the performance of insurance companies. Their findings provide the evidence that IC has a very positive relationship with the productivity and financial outcomes of the selected firms. Pew Tan, Plowman and Hancock (2007) conducted their empirical analysis for the IC and various financial outcome indicators. For instance, they focused on the return on equity ROE, earning per share EPS and market value of equity etc. Youndt, Snell, Dean, and Lepak (1996) have explored the same idea in the context of Greece and found that there exists a significant positive link between IC and the performance of the business firm.

Besides this some have inspected the impact Intellectual amount of capital has on firm outcomes of Australian organizations and found that immediate affiliation was there amongst VAIC and outcomes of firms, especially with efficiency of the capital employed in the business have lesser relationship with HCE (Abeysekera, 2010; Dwivedi & Jain, 2005; Hillman & Dalziel, 2003; Ho & Williams, 2003; Kiel & Nicholson, 2003; Nicholson & Kiel, 2004). Chan (2009a, 2009b) completed an investigation in Hong Kong stock trade and no critical affiliation was found between Intellectual amount of capital and four budgetary outcomes measures specifically ROA, ATO, ROE and MB. Physical capital was observed to be the most critical factor enhancing

gainfulness, profitability and advertise valuation of the organizations.

Theoretical Framework

Resource Based View or RBV theory explains the idea that in order to get sustainable

advantage it is complementary for the business to focus on both its tangible and intangible assets (Riahi-Belkaoui, 2003).

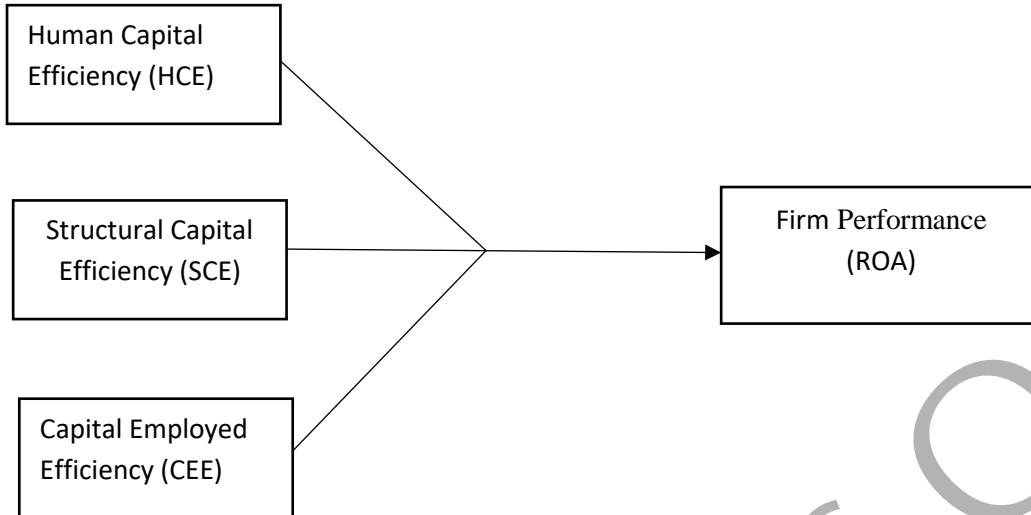


Figure: Theoretical Framework of the Study

Methodology

For research objectives to align with the methodology, a quantitative study was conducted using secondary data. Data set in the present study analysis is collected from the official web page of national Institute of Statistics specifically focusing on the manufacturing sector of Pakistan. the core reason to select these firm is based on the idea that the data sets for these firm is available up to maximum extent. The time period of the study is 2006-2015 with the annual observation criteria. Only those units of observation are selected which have the availability of the data over the selected time period of the study. A total population of 156 textile companies from the Pakistan Stock Exchange (PSX) is taken as the as population for this research and the sample size will consist of 78 companies. Sample of seventy-eight companies is taken due to the reason of availability of data.

Description and Measurement of Variables

The variables comprised in this research as well as with their calculations are:

Dependent Variable

One dependent variable is taken in this research as shown below:

Profitability (ROA)

The key outcome factor in the existing study is return on assets which has got significant attention in literature. It is known as the accounting measure of the firm performance which is created based on the accounting data. It can be measured both in terms of before tax and after tax and is used in all type of business organizations like financial or non-financial. Studies of (Heikal, Khaddafi, & Ummah, 2014; Selling & Stickney, 1989; Setyorini, Minarsih, & Haryono, 2016) are some of evidence for the usage of ROA as key performance indicator.

Return on Assets

Following is the formula to measure Return on assets in the present study:

$$(ROA) = \frac{\text{Net Income After Tax}}{\text{Total Assets of the Business}}$$

Independent Variables

The key explanatory factor of the study is value added intellectual capital coefficient or VAIC which was developed by (Pulic, 2000). The idea for the development of VAIC is to calculate the value of Intellectual capital based on the available accounting and financial records of the company. Among the various approaches, VAIC is widely accepted and repeatedly used in the existing and previous studies (Bornemann, 1999; Laing, Dunn, and Hughes-Lucas, 2010; Nazari & Herremans, 2007; Stähle, Stähle, & Aho, 2011).

Value Added Intellectual Capital Coefficient (VAIC)

VAIC will help to calculate the three components of IC. Formula is as under

$$VAIC = CEE + HCE + SCE$$

Where, CEE = Capital Employed Efficiency, HCE = Human Capital Efficiency and SCE = Structural Capital Efficiency. These can be measured as given below:

$$Capital\ Employed\ Efficiency\ (CEE) = VA/CE$$

Where, Capital Employed (CE) = book value of the net assets

$$Human\ Capital\ Efficiency\ (HCE) = HC/VA$$

Where, Human Capital (HC) = wages and salaries of employees

$$Structural\ Capital\ Efficiency\ (SCE) = SC/VA$$

Where, Structural Capital (SC) = VA – HC

Value Added (VA) can be calculated as follows:

$$VA = Operating\ Profit + Employee\ costs + depreciation$$

Or

$$VA = OUTPUT\ (Total\ Income) - INPUT\ (All\ costs\ of\ pu$$

Model Specification

As mentioned underneath the model developed denotes all of the given variables that may affect firm’s performance.

$$ROA_{it} = \beta_0 + \beta_1 (CEE)_{it} + \beta_2 (HCE)_{it} + \beta_3 (SCE)_{it} + \epsilon_{it}$$

$$ROA_{it} = \beta_0 + \beta_1 (VAIC)_{it} + \epsilon_{it}$$

Where, β_0 = Intercept and Coefficients of Slope or Slope of Line = $\beta_1, \beta_2, \beta_3$, and ϵ = Error Term.

Findings

Table 1 Descriptive Statistics

VARIABLES	OBS	MEAN	STD DEV	MIN	MAX
ROA	742	7.012102	10.96624	-22.8	53.13
HCE	742	1.807561	2.360475	0	18.1
SCE	742	0.592116	1.287702	-11.9	11.06
VAIC	742	2.315589	2.893197	-13.83	19.40806

In the very first table, descriptive statistics of the study are presented. Here the total number of observation for the variables of the study is 742 which is final product of cross-sectional units of observations over a period of time. the mean value for the return on assets is maximum which is 7.012 while the mean value for the HCE is 1.80 and for SCE is .59 and for the VAIC is 2.31. in addition, the value of standard deviation for the ROA is maximum which is 10.96 and for HCE it is 2.30 for SCE it is 1.28 and finally for VAIC, it is 2.89 as well. The range of values in

terms of maximum and minimum are also presented in the above table.

Before going for the further analysis, it is very much necessary to check the level of association between the major explanatory variables of the study. This issue is called correlation which is known as the problem of multi-collinearity. Correlation will diagnose the strength and direction of association between the selected IVs of the study. For this purpose, correlation matrix is presented in the table below.

Table 2 Correlation Matrix among the variables

	ROA	HCE	SCE	VAIC
ROA	1			
HCE	0.2245***	1		
SCE	0.0709*	0.0577	1	
VAIC	0.4033***	0.5876***	0.442***	1

Table above explains the outcomes for correlation of the study. Here the correlation between all the major explanatory factors is presented. So, from above table it can be seen that correlation is significant between the some of the factors except the correlation between the HCE and SCE is significant at 05 % level. In addition, the level of correlation between HCE and ROA, between ROA and SCE is significant and positive as well. This correlation is positive

but weak and there is no need to worry about it. So, from the above table it can be concluded that there is no issue of correlation between the variables so we can consider all the factors for the further analysis.

Before going for the final regression models, the problem of correlation is identified through variance inflation factor VIF is examined. Table below explains the outcome for the VIF test.

Table 3 VIF Test

Variable	VIF	1/VIF
VAIC	2.05	0.487608
HCE	1.66	0.60401
SCE	1.35	0.742252
Mean VIF	1.68	

As per the above findings, it is clear that the value of VIF for all the predictors factors of the study is less than 5. While the mean value for VIF is also less than which is 1.68, explaining the

idea that there is no problem for the correlation in the selected factors of the study. It means that all the factors can be considered for the final regression analysis as below.

Table 4 Pooled Regression Model Fit Outcomes

Source	SS	df	MS	Number of OBS = 742	
				F (3, 738)	53.82***
Model	15997.32	3	5332.43985	Prob > F	0.000
Residual	73114.24	738	99.0707809	R-squared	0.1795
				Adj R-squared	0.1762
Total	89111.56	741	120.25851	Root MSE	9.9534

Table 04 explains the goodness of fit for the first regression model of the study. For this purpose, researcher has developed the following research and null hypothesis

H₀: Model is not good fit

H₁: Model is good fit Or

H₀: all the coefficients are zero

H₁: all the coefficients are different from zero

The value of F-statistics in the above table is 53.82 which is above the standard value and quite acceptable. The value of Prob. is .000 which is less than 01% so finally researcher can

accept the alternative hypothesis with the 99 % level of confidence and states that all the coefficients in the above regression model are different from zero or the model is good fit. R² explains the total variation in the DV as explained by all the explanatory factors of the study. In the current analysis the value of R² is 17.95 which explains that all the explanatory factors in the first equation explains the variation of 17.95 in the DV; ROA. The adjusted value of R² is the adjusted value of R² as per the sample size of the study. The adjusted value of R-square is 17.62.

Table 5 Pooled Regression Outcomes

ROA	COEF.	STD. ERR.	T	P>T	[95% CONF.	INTERVAL]
HCE	-0.30314	0.199316	-1.52	0.129	-0.69444	0.088152
SCE	1.27553	0.329589	-3.87	0.000***	-1.92257	-0.62849
VAIC	1.924838	0.180988	10.64	0.000***	1.569525	2.280151
_CONS	3.858177	0.49396	7.81	0.000	2.888443	4.827911

Table above explains the outcomes for the pooled regression outcome. Here the value of coefficient for the HCE is -.30314 which explains that unit change in the value of HCE causes a change of -.30314 in the value of ROA. This change is insignificant as the value of probability is .129 which is greater than 5 % level of significance. So, finally researcher can conclude that there exists an insignificant and negative impact of HCE on the value of ROA; the main DV of the study. The value of coefficient for the SCE is 1.27 which indicates a negative change in the

value of ROA. The value of t-statistics is -3.87 which is also above the standard value of 1.96 so we can finally conclude that the relationship between ROA and SCE is significant and positive. The third explanatory variable of the study is VAIC has the value of coefficient of 1.92 which explains a positive impact on ROA. The value of t-statistics is 10.64 is greater than 1.96, while p value is significant at 01 %. This value indicates a significant and positive impact of VAIC on ROA

Table 6 Least Square Dummy Variable Model of Fit

Source	SS	df	MS	Number of OBS =	742
				F (80, 661)	13.77***
Model	55690.03	80	696.125346	Prob > F	0
Residual	33421.53	661	50.5620699	R-squared	0.6249
				Adj R-squared	0.5796
Total	89111.56	741	120.25851	Root MSE	7.1107

The above table explains the outcome of model fit for the least square dummy variable model of LSDVM. The value of f-statistics is 13.77 with the significant p value as well. It indicates that all the coefficients in the stated model is good. The value of R-square is 62.49 % which indicates

that overall predictors have caused a change of 62.49 % in return on assets of the textile model of the study. The value of adjusted R-square is 57.96 % which explains the adjusted value of R-square as per the sample size of the study.

Table 7 Fixed effect model (FEM)

ROA	COEF.	STD. ERR.	T	P> T	[95% CONF.
HCE	-0.44668	0.191434	-2.33	0.02**	-0.82257
SCE	0.81465	0.270023	-3.02	0.003***	-1.34485
VAIC	1.301019	0.181357	7.17	0.000***	0.944915

Table above explains the outcomes for the Fixed effect model (FEM) in which ROA is DV and HCE and SCE and VAIC are the major independent variables of the study. The value of coefficient for the very first factor of the study is -.44 which indicates that unit change in the value of Human capital efficiency causes a change of -.44 in the value of ROA. This change is negative and significant as the value of prob is less than 01% chance of error and t-statistics is also above the accepted region which is 1.96. The 2nd explanatory factor in the 2nd equation is the SCE.

The regression coefficient for the SCE is .81465. This value is positive significant as the p value is in the acceptable range and meanwhile the value of t-statistics is also greater than the standard value of 1.96 which is -3.02. the value of co-efficient for the VAIC is 1.30 which explains significant and positive change in the value of ROA. The same above findings have been considered for the fixed effect model as the theoretical approach for both the LSDVM and FEM is same.

Table 8 Random Effect Model (REM)

ROA	COEF.	STD. ERR.	Z	P> Z	[95% CONF.
HCE	0.026223	0.204839	0.13	0.898	-0.37525
SCE	1.69043	0.331024	-5.11	0.000***	-2.33923
VAIC	2.043042	0.179514	11.38	0.000***	1.691201
_CONS	3.210617	0.806546	3.98	0.000***	1.629816

Table explains the outcomes for Random Effect Model (REM) in which ROA is DV and HCE, SCE and VAIC are the major independent variables of the study. The value of coefficient for the very first factor of the study is .026 which indicates that unit change in the value of Human capital efficiency causes a change of .026 in the value of ROA. This change is positive and

insignificant as the value of prob is greater than 01% chance of error and t-statistics is also not above the accepted region which is 1.96. The 2nd explanatory factor is the SCE. The regression coefficient for the SCE is 1.69. This value is positive but significant as the p-value is not in the acceptable region and meanwhile the value of t-statistics is also less than the standard value of

1.96. The value of coefficient for the VAIC is 2.04 which indicates significant and positive change in the value of ROA.

After the application of the four panel regression models, the next step is to compare the findings of both fixed and the random effect. For this purpose, Hausman test is applied which makes

the comparison between fixed and random effect. Table underneath explains the coefficient for both the fixed and random effect and their key difference between both coefficients. After the findings of key difference of the coefficient, the next step is to consider the both null and alternative hypothesis of the study.

Table 9 Hausman Test

TEST LISTS	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
VARIABLES	FIXED	RANDOM	DIFFERENCE	S.E.
HCE	0.179474	0.026223	0.153251	0.0388231
SCE	-1.88374	-1.69043	-0.1933	0.0433011
VAIC	2.100084	2.043042	0.057043	0.0113358

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\text{chi2}(3) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 12.95$$

$$\text{Prob}>\text{chi2} = 0.0047***$$

(V_b-V_B is not positive definite)

The findings of the above model describe the following two hypotheses

H₀: Difference in the coefficients is not systematic

H₁: Difference in the coefficients is systematic

The value of prob. Is .0047 which is less than .05 which indicates that findings of fixed effect model are acceptable for the decision making. So, based on the above model is concluded that fixed effect model is appropriate for the decision making.

Conclusion and Recommendations

Conclusion

The focus of present study is to examine the relationship between the intellectual capital and performance of various textile firms currently working in Pakistan

To address the stated problems above, all the textile firms have been considered as a core population. After that only those were selected for the study which has a data for the targeted time of the study.

The key factors which were considered was the return on assets as a main proxy for measuring the financial performance of selected firms which is also known as main explained variable. While intellectual capital and related factors are considered as major explanatory variables of study.

1. For the analysis purpose statistical software like STATA-14 has been considered.
2. The outcomes of the study are based on the panel data modelling approach in which panel regression models are

considered for each of the separate regression equations as mentioned earlier. Pearson correlation matrix is developed and presented with the ultimate decision criteria about the problem of correlation is identified through variance inflation factor or VIF test and besides the above all descriptive statistics of the study have also been presented to check the trend of the data set.

3. The impact of intellectual capital on firm performance final findings have presented very meaningful and interested facts. The outcomes revealed the fact that among the key explanatory factors of intellectual capital, there exists a significant and positive relationship between the intellectual capital and firm performance over a selected time frame. In the very first regression model, the outcomes are in favor for the alternative hypothesis that there exists a significant and positive association between the VAIC and ROA.
4. Various panel regression models are fit for the final decision making based on the presented facts of F-statistics. However, the implication of husman test have explained the idea that fixed effect model with the key findings is very much acceptable. The vlaue of prob. is significant at 05 % level of significant which explains that difference in the value of coefficents for both the fixed and random effect is systmatic and preferred model is fixed effect.
5. The association of IC and financial performance of the selected firms is very much significant and needs significant attention in upcoming body of literature.
6. The management of textile sector in Pakistan should have to pay significant attention towards the IC and firm performance. Among the key indicator of

IC, human and structural capital are playing their major role.

7. The consideration of more and better sample size will increase the probability of better findings. The investigation of other factors of IC like social capital, spiritual capital also needs significant attention from the researchers.
8. The growth in the textile industry is purely linked with the more investment in IC, so this problem should also be investigated by the management and key policy makers in textile sector. The decline in the performance of textile sector needs serious attention as it is considered as backbone in the overall economy.

Limitation of the Research Study

These are the some of the limitation our study.

1. This research work is purely based on the one sector from the overall industry which is textile and it is not considering the all the firms in the same industry for the overall research analysis.
2. Current study is based on the selected sample size of 78 textile firms from the time of 2006 to 2015. The sample of the study is not a very good.
3. The data is based on the annual reports and online available sources just. It is not considering all the valid sources like the data stream and other data based which are globally accepted from the collection of valid data.
4. This study is just focus on the very limited no. of explanatory variables. There are still many other factors that should be considered to get the better results.

Future Implication

1. Help the management of the textile firms specially and various other decision markers while going for the profitability determinants regading intellectual captial.
2. Governmental officials and various policy makers can use this study in order to thoroughly and deeply explain and predict

the future position of textile sector in terms of financial performance.

Recommendations

Followings are the key recommendations of the study

1. Present study recommends the management of the textile sector to focus on the IC as there is very little attention towards this resource.
2. More investment on human and their growth in textile sector is recommended as it is a significant key for the success.
3. This study recommends the shift of textile industry from traditional economy to the knowledge based industry.
4. Country level decision makers are also recommended to consider the findings which are very much beneficial for the improvement and growth of textile industry.

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