

Intellectual Capital and Financial Performance: A Comparative Investigation of Top Five Sectors of Pakistan

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ABSTRACT

Intellectual capital is way to gain competitive advantage on other rivals. This study captured five sectors of Pakistan to get the idea that which sector performs better with respect to the concept of intellectual capital. For this purpose five years' financial data from profit & loss statements and balance sheets of organizations of these five sectors used. After that with help of E-VIEWS software regression analysis perform for declaration of final result. At last results showed that three out of five sectors follow this concept and sector of personal goods among all five sectors performs best.

KEY WORDS: Intellectual capital, human capital, structural capital and capital employed.

1. INTRODUCTION

Intellectual capital is technique of attaining the competitive edge by consuming human, structural and physical capital in distinctive way. This concept is essential due to intangibility characteristics same as other intangible assets. This concept is associated with knowledge management, which guides us the way to achieve the desire goal. This is one reason many studies proved that enhancement in intellectual capital causes improvement in progression for example Indian software sector prove it (Ghosh & Mondal, 2009). Narvekar & Jain (2006) identify that by enhancing skills organization will be able to increase the profits not only in short run but on other hand they sacrifice their comfort level and unable to gain long term profits. Pulic (2004) identified that skills enhancement required massive investment for gaining profits.

Main focus of study is on "*top five sectors of pakistan*" on basis of market capitalization. Basically major cause of selecting top five sectors is to make comparison that which sector performs better in comparison with others and follow pattern of intellectual capital. Reason behind this investigation is not only determine what happens if components of intellectual capital show improvement?

Anon (2005) explained the same concept of improvement in intellectual capital not only enhance the organization worth but also helps to earn extra profit.

So, five sectors under consideration were:

- ✓ Real Estate Investment and Services sector
- ✓ Chemicals sector
- ✓ Construction and Materials sector
- ✓ Personal Goods sector
- ✓ Fixed Line Telecommunication sector

Now these days, financial institutions experienced change and competition. So, this study is a reasonable way to inspect which sector of Pakistan performs better. Thus, Intellectual capital is judge as vital business resource that is considerable for financial advancement. Chen et al., (2005) investigate major optimistic effect of intellectual capital on company's market value. Further a study explained that intellectual capital consists of all intangible assets that are necessary for the organizational progression (Roos & Roos, 1997). On the basis of above explanation following objectives of the investigation drawn:

- ✓ To investigate the relation between intellectual capital and financial performance of top five sectors of Pakistan.
- ✓ To investigate which sector performs better with respect to intellectual capital among all five sectors of Pakistan.

After the introduction in first part of paper, 2nd part explained brief literature review on particular topic. 3rd part explained theoretical frame work in which explanation of dependent and independent variables done. 4th part explained all possible research hypothesis of study and 5th part explained research methodology in which method of data collection and analysis done. At last 6th and 7th part elaborated the findings and conclusion of study respectively.

2. LITERATURE REVIEW

Intellectual capital acts as resource for the organization that is one reason it have same significance as other assets. Now these days it is consider as an essential element of investment rather than cost. But for getting accurate results mostly literature use the concept of value added intellectual capital rather than simple intellectual capital. That is one reason value added intellectual capital is the concept that show either value is created or not and in which amount that value is created (Pulic, 2004). Castro, et al. (2006) explained the fear or terror of losing the old skills prevent to adopt new skills that is biggest drawback for an organization. Stam (2009) explained the same concept according to which intellectual capital become burden on organization just because misuse of resources and unable utilize their skills in effective way. Basic reason is if employees are satisfied then they are loyal to their job and works better as a results of all these factors, automatically organizational progression will improved (AYDOGDU & ASIKGIL, 2011).

Giuliani (2013) explained in his investigation that in some cases intellectual act as liabilities. Sometime these liabilities proved to become the key root for dismay of an organization. Major cause of liabilities is when organization tries to introduce new skills in their employees but in return employees' are unable to grasp those skills then it causes the main distraction of an organization.

For the success of new organization intellectual capital is most important concept. This thing is verify by making an analysis of 130 new organizations and conclude that most important components for the success of any organization are human capital and its relationship building capacity. By adopting those in an effective way organization will be able to gain competitive edge (Hormiga, M, Canino, & Medina, 2011).

From studies it is prove that there is linkage between intellectual capital and knowledge management. It is verify from studies that by adopting all elements of intellectual capital with help of relevant knowledge organization will be able to improve progression (Zhou & Fink, 2003). A study explained its linkage with management working and elaborate that management works well by grasping new skills and in result organization progress will be improved (Demartini & Paoloni, 2013). By the introduction of knowledge-based economy, intellectual capital is considered as way to enhance innovative capability and its execution causes achievement of sustainable competitive advantage. That is way now these days' universities try to introduce innovative skills, interdisciplinary talent to gain sustainable competitive edge. A study from Taiwan it is shown that by improving the innovation ability organization will be able to gain sustainable competitive edge globally (Chen & Chen, 2013).

A study conducted that show the association between intellectual capital and export performance. Further in a study value added intellectual capital used rather than intellectual capital to check the same association (Pucar, 2012). Iranian pharmaceutical industry showed same positive relationship, means by improving the components of intellectual capital organization will be able to improve the organizations' performance (Sadeh, Mehralian, Rajabzadeh, & Reza, 2012). Australian investigation defines the same concept that both intellectual capital and performance of company shows association. This concept is verified with the help of organizations' financial data (Clarke, Seng, & Whiting, 2011). Thailand investigation gives understanding of intangible assets and firms' progression in which financial data of an organization used for getting beneficial results (Phusavat, Comepa, Lutek, & Ooi, 2011). From Malaysian perceptive same concept of improvement of intellectual capital causes the improvement in performance proved (Goh, 2005). An Indian bank evaluates the idea of Value Added Intellectual Coefficient and its operation with the help of annual reports. Study justified bond of human capital, physical capital and banks performance (Kamath, 2007). Haji & Mubaraq(2012) elaborated Nigerian bank that illustrate the significance of effective skill management and its direct relation with progression of an organization.

LEANA (1999) in study explained the relationship of rational capital and progression of an institution and prove that strong relationship building also show improvement of profits of an organization. Iran insurance companies showed the same trend of direct relationship (Alipour, 2012).

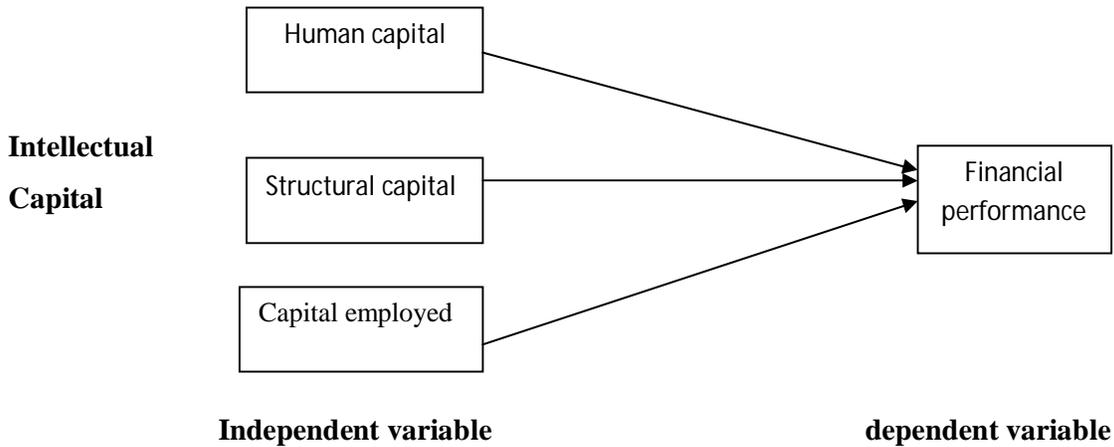
Another study spread light on functioning of intellectual capital and further explained its relationship with job rotation. Outcome of the study showed that job rotation creates uncertainty for components of intellectual capital (Brunold & Durst, 2012).

An investigation explained the separate demonstration of Intellectual capital components in annual reports of an institution. Major reason to display this information is to enhance loyalty among stakeholders and good for repute building (Anam, et al., 2011). Thus, same concept is checked in Jordan's pharmaceutical organization perceptive and it also has same purpose to establish association among IC and prosperity (Sharabati, et al., 2010; Kamath, 2008).

Past investigation used organization database or annual reports to check the same direct relationship (Pulic, 2004), ('Donnell, et al., 2006). In contrast Ling (2012) used questionnaires as a tool for data collection. Further an examination of jordan use questionnaire technique for data collection and apply the results on whole pharmaceutical sector (Sharabati, et al., 2010). So, on the basis of literature following hypothesis made for the study.

3. Theoretical framework:

Below diagram show the relationship of independent variables with dependent variable. Here human capital, structural capital and capital employed are taken as independent variable and organizational performance (ROA, ROE) is taken as dependent variable.



4. Research hypothesis:

Following hypothesis made on the basis of literature discuss above:

4.1. Human capital and financial Performance:

Rompho & Siengthai (2012) explained the importance of human for an effective working of an organization. He explained by educating and learning of workforce organization will be able to perform better. Baum & Silverman (2004) explained the importance of experience of employees that they gain with the passage of time for knowledge enhancement. He also explained the enhancement of innovation opportunities to employees help organization to become profitable. Thus, from literature it is prove that improvement and advancement in human capital causes the ultimate benefit for the organization (Bontis & Fitz-enz, 2002). On the basis of previous study the hypothesis develop for the investigation is:

H₁: There is association between Human capital and financial progression of an organization.

4.2. Structural capital and financial performance:

Structural capital is also a vital donor for financial progression. It includes all system and programs that are fundamental components to run a business. In structural capital organizational environment and development both are essential particles that facilitate to upgrade the present state of an organization (Abdel-Aziz Ahmad Sharabati, et al., 2010). Alipour (2012) explained it as way to enhance value to the environment of the institution. Thus, on the basis of previous literature we get the hypothesis:

H₂: There is association between structural capital and financial progression of an organization.

4.3. Capital employed and organization performance:

Capital employed is third most essential constituent for calculation of value added intellectual capital. Capital employed efficiency used for investigating the influence of capital employed on organization's working. Capital employed is defined as book value of the firm's net asset. Or its calculation will be performed by taking the difference of total assets and current liabilities (Pulic, 1998). Basically it acts as capital investment (equity+ long term liabilities) that is important for business functions. On the basis of literature following hypothesis made:

H₃: There is association between capital employed and financial progression of an organization.

4.4. Intellectual capital and performance of organization:

Mehralian, et al.(2012) investigated the positive association among constituent of intellectual capital and progression of an organization. After that if combine all the components and observe its effect, then it is also prove that intellectual capital shows effect on performance (Mehralian, et al., 2012). Same concept is repeated in Malaysian industries and got the same result of direct relationship and explain that it causes improvement of whole economy (Bontis, et al., 2000). So on the basis of previous studies we develop hypothesis:

H₄: There is association between intellectual capital and progression of an organization.

4.5. Comparison:

At last comparison done of all five sectors to check which sector performs better among all and works according to the concept of intellectual capital.

5. Research methodology:

Main objective of the study is to investigate which sector performs better among all five sectors of Pakistan. This study is based on time series data. In this investigation secondary data was used. And all the data is numeric in nature so it not wrong to say that this study is quantitative based. Top five sectors that were selected on the basis of market capitalization consist of 250 organizations. Following are the number of companies in each sector:

- ✓ Real Estate Investment and Services sector (2 companies)
- ✓ Chemicals sector (34 companies)
- ✓ Construction and Materials sector (37 companies)
- ✓ Personal Goods sector (172 companies)
- ✓ Fixed Line Telecommunication sector (5 companies)

5.1. Data collection method:

Annual reports of selected organizations used to obtain the data for analysis. In annual reports “profit and loss accounts and balance sheets” of the organizations were of major consideration. Value added intellectual coefficient technique utilized for evaluation of value based progression of an institution. Gain from asset and from equity used to measure the profitability and productivity of Pakistani organizations.

Intellectual capital taken as independent variable and profitability and productivity of an organization is taken dependent variable. Here intellectual capital is split into three components:

- i. Capital employed
- ii. Human capital
- iii. Structural capital

As dependent variable ROE and ROA will be taken for analysis of an organization.

5.2. Data analysis techniques:

Here with the help of regression analysis relationship between variables proved. Further value added intellectual capital methodology used for investigation. This method is used by management, shareholders and stakeholders to effectively examine and estimate the organization performance. Basically organizations with a higher value added intellectual capital specify that they have greater ability to create value in using all obtainable resources, like human, structural and physical capital. Following equation shows the value added intellectual capital relationship algebraically:

$$VAIC = HCE + SCE + CEE$$

Here VAIC is VA intellectual coefficient for company; CEE is capital employed efficiency for company; HCE is HC efficiency for company; and SCE is SC efficiency for company.

The first step will be to calculate CEE, HCE and SCE. For that purpose first calculation of value added amount done. For that purpose study take the difference of operation expenses and operating revenue. After that CEE is the ratio of total VA divided by the total amount of capital employed. The following equation presents the CEE relationship:

$$CEE = VA / CE$$

Next human capital will be calculated with the help of following equation:

$$HCE = VA / HC$$

Here value added is divided by the total salary and wages spent by the firm on its employees.

At last for calculation of SCE foremost it is essential to find out the worth of a firm's structural capital. For this purpose firm total “VA less its human capital” used as alternative of a firm's structural capital.

$$SC = VA - HC$$

After that calculation of SCE done with the help of following equation:

$$SCE = SC / VA$$

5.2.1. Control variables:

In this investigation following variables were taken as control variables. Here control variables used to isolate the contribution of intellectual capital to organization's financial progression. Following are few control variables in the study:

- i. **Size of the firm:** It is used as control variable due to influence of size of organization on overall corporate progression.

- ii. **Asset turn over:** This ratio is used as control variable to organize the impact of total assets on corporate performance.

6. Findings of study:

Following are the findings of the study:

SECTOR 1(Real Estate Investment and Services)

SECTOR 1(Real Estate Investment and Services)										
	2008		2009		2010		2011		2012	
ROA (dependent variable)	t-value	Prob value								
Independent variables										
CEE	1.0058	.3407	1.0058	.3407	1.0058	.3407	1.0058	.3407	1.0058	.3407
HCE	1.5569	.2174	1.5569	.2174	1.5569	.2174	1.5569	.2174	1.5569	.2174
SCE	.2281	.8246	.2281	.8246	.2281	.8246	.2281	.8246	.2281	.8246
VAIC	.9886	.3487	.9886	.3487	.9886	.3487	.9886	.3487	.9886	.3487
ROE (dependent variable)	t-value	Prob value								
Independent variables										
CEE	3.3363	.0087	3.3363	.0087	3.3363	.0087	3.3363	.0087	3.3363	.0087
HCE	2.6275	.0275	2.6275	.0275	2.6275	.0275	2.6275	.0275	2.6275	.0275
SCE	.5834	.5834	.5834	.5834	.5834	.5834	.5834	.5834	.5834	.5834
VAIC	2.6512	.0264	2.6512	.0264	2.6512	.0264	2.6512	.0264	2.6512	.0264

Interpretation:

From the analysis of real estate investment and services sector it is prove that it all the results are not fruitful. And detail of this statement depicts below:

Table showed that when ROA is taken as dependent variable all the values are insignificant. Table showed that t-value < 1.98 which means it supports the null hypothesis; thus variables have not relationship. Here p-value > 0.05 which also represents that insignificance of relationship which again show acceptance of null hypothesis of having no relationship. On the other hand relationship in which ROE is taken as dependent variable; few t and p values showed that the relationship exit but all values are not significant.

So, from sector 1 result it is proved that it can't fulfill the concept of value added intellectual capital.

SECTOR 2 (Chemicals)

SECTOR 2 (Chemicals)										
	2008		2009		2010		2011		2012	
ROA (dependent variable)	t-value	Prob value								
Independent variables										
CEE	2.0536	.0557	3.6548	.0020	3.9573	.0010	4.0251	.0009	1.0042	.3302
HCE	6.4390	.0000	-1.6937	.1097	1.5296	.1445	1.9217	.0465	2.7722	.0043
SCE	2.0793	.0530	.9969	.3328	2.9880	.0083	2.6355	.0534	1.9659	.0482
VAIC	5.4860	.0000	-1.6742	.1135	2.1608	.0453	3.2321	.0194	2.2782	.0359
ROE (dependent variable)	t-value	Prob value								
Independent variables										
CEE	2.8104	.0279	1.3846	.1841	2.5280	.0217	3.3311	.0040	2.8413	.0413
HCE	1.9432	.0088	-.3108	.7597	-1.0577	.3059	-.6741	.5098	2.1633	.0261
SCE	1.2720	.2205	1.0614	.0517	2.2320	.0394	4.1549	.0079	-.3917	.7004
VAIC	1.9548	.0430	-0.2923	.7735	1.5292	.1446	2.4481	.0201	1.9422	.0495

Interpretation:

In sector 2, t-value show significant results except in 2009. This insignificant result is might be due to the effect of financial crisis faced at the end of 2008. But values of remaining years depicts that t-value > 1.98 which means it supports the hypothesis of positive relationship. After that p-value < 0.05 which also represents the significance of relationship. On the other hand relationship in which ROE is taken as dependent variable; almost all t and p values showed that the relationship exit. So, results showed positive relationship of components of intellectual capital with productivity and profitability.

SECTOR 3 (Construction and Materials)

SECTOR 3 (Construction and Materials)										
	2008		2009		2010		2011		2012	
ROA (dependent variable)	t-value	Prob value								
Independent variables										
CEE	.2032	.2032	.2032	.8152	.5789	.5712	-1.3544	-1.3544	-1.3544	-1.3544
HCE	-1.3544	-1.3544	.2263	.8240	.2263	.7583	-.9966	.3347	.3347	.2433
SCE	.8548	.4061	.9590	.9590	.9590	.9353	1.1978	.0458	1.9841	.0658
VAIC	.8164	.4270	.2440	.8105	.3107	.7603	-.9968	.3347	1.2160	.2428
ROE (dependent variable)	t-value	Prob value								
Independent variables										
CEE	1.0563	.3075	-.3165	.7560	.4924	.6295	-2.9581	.0098	3.0312	.0084
HCE	.4049	.4049	-.5509	.5898	.6387	.5326	-2.5640	.0216	1.0599	.3060
SCE	-.8461	.4108	-1.1200	.2803	.5904	.5637	-1.1919	.2518	2.2741	.0381
VAIC	-.8127	.4291	-.5691	.5777	.6415	.5308	-2.5749	.0211	1.1141	.2827

Interpretation:

Form the results of sector 3 data, value can't show significant results. Both p and t values showed insignificant relationship between independent and dependent variables. So, study proved sector 3 can't show significant results.

SECTOR 4 (Personal Goods)

SECTOR 4 (Personal Goods)										
	2008		2009		2010		2011		2012	
ROA (dependent variable)	t-value	Prob value								
Independent variables										
CEE	2.1425	.0475	3.7840	.0384	1.9980	.0304	2.0663	.0040	1.9033	.0727
HCE	2.2698	.0089	1.9086	.0406	3.8300	.0123	1.975	.0479	2.8628	.0343
SCE	1.0096	0.0086	2.0686	.0457	2.0317	.0049	4.7381	.0000	2.8101	.0235
VAIC	2.4209	.0455	3.3844	.0030	2.0804	.0363	5.1480	.0000	2.7069	.0444
ROE (dependent variable)	t-value	Prob value								
Independent variables										
CEE	1.9895	.0091	1.9237	.0368	2.7444	.0096	2.2064	.0342	1.9976	.0258
HCE	1.9473	.0502	5.6840	.0000	1.9451	.0027	1.8030	.0277	2.6066	.0481
SCE	2.1993	.0489	1.9817	.0569	2.0901	.0287	3.1235	.0037	2.0135	.0093
VAIC	1.9942	.0466	2.3663	.0008	2.2777	.0029	3.8422	.0005	2.1020	.0193

Interpretation:

Sector 4 shows all significant results. All t and p value show the acceptance of hypothesis made, means components of intellectual capital have significant relation with both dependent variables ROA and ROE. So, study draws the conclusion that by making improvement in components of intellectual capital organization showed improvement in productivity and profitability.

SECTOR 5 (Fixed Line Telecommunication)

SECTOR 5 (Fixed Line Telecommunication)										
	2008		2009		2010		2011		2012	
ROA (dependent variable)	t-value	Prob value								
Independent variables										
CEE	.6482	.5522	3.8534	.0182	3.2757	.0064	1.9548	.0195	.5068	.6389
HCE	.5220	.6292	3.5576	.0236	1.7188	.0576	2.5757	.0416	-3.4443	.0262
SCE	-3.0954	.0535	1.9642	.0210	1.8205	.0510	1.9548	.0408	-1.1266	.3229
VAIC	2.4903	.0450	3.5718	.0233	1.9938	.0546	2.4373	.0414	3.1079	.0359
ROE (dependent variable)	t-value	Prob value								
Independent variables										
CEE	1.9301	.0260	2.7437	.0483	-.6804	.5336	2.8418	.0393	-.0413	.9690
HCE	2.5091	.0375	2.6988	.0232	.1792	.8664	-3.0981	.0363	-.1263	.9056
SCE	2.2866	.0435	1.6458	.1751	-.1153	.9137	1.9879	.0378	-.4727	.6610
VAIC	.5410	.6172	2.7039	.0203	.1588	.8815	2.9319	.0427	-.1409	.8947

Interpretation:

Here fixed line telecommunication sector show unclear results. Reason behind is few values explain positive results but few show negative results.

7. Conclusion:

With the help of regression analysis study proved that intellectual capital and progression are directly related to each other. It means improvement in components of intellectual capital causes the enhancement of organization progress. This investigation takes two dimensions of performance, one is productivity and other is profitability.

This study showed that personal goods sector perform better among all five sectors. So, by taking this sector as base it is proved that above four hypotheses are true, and improvement in human, structural and capital employed also causes improvement in productivity and profitability.

In detail proved that improvement in human capital not only causes the improvement in profitability but also causes the enhancement of productivity of an organization. After that improvement of structural capital also proved essential component for progression. And capital employed is the major factor for investment and working of an organization. But for effective productivity and profitability it is important that all components of intellectual capital must work properly. Basic reason behind is all factors are interlinked; like for workforce improvement which is included in human capital it is essential to provide them sound and proper environment according to their job. And sound and proper environment at workplace is included in structural capital.

At last this study proved that three out five sectors represent the direct relationship. And also prove that intellectual capital is way to add value to the progress of an organization. So, it is also concluded that personal goods sector performs best among all five sectors of Pakistan.

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