IMPACT OF INTELLECTUAL CAPITAL ON CORPORATE PERFORMANCE

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Abstract:
Modern organizations build access and nurture knowledge resources to create competitive advantage. Physical and financial resources have been eclipsed by knowledge resources to create value addition for organization there by creating sustainable "knowledge advantage". Research in intellectual capital involves identification, understanding and measuring of the hidden factors like intellectual capital, human capital and social capital so on. Proponents of intellectual capital research opine that these invisible factors affect the performance of companies. This paper assesses the analytical approach to measuring the value creation efficiency of intellectual capital by using Ante Pulic's Value added intellectual capital VAIC™ method. The study is done on two major Indian industries which are heavily reliant on intellectual capital. They include Banking and Information technology Industry. The period of study is 11 years (2000 – 2010). The study measures correlation between company's intellectual capital and corporate performance. In addition to this, structural equation modeling (SEM) has been carried out using PLS-Path modeling to analyze the impact of intellectual capital on corporate performance and understand its relative impact and predictive relevance.

Keywords: intellectual capital, human capital, VAIC™, SEM, corporate performance, PLS-PM

1. INTRODUCTION

Rise of the 'new economy' principally driven by knowledge and information has created a huge interest in intellectual capital (Stewart, 1997; Thurow, 1999; Petty and Guthrie, 2000). Research in Intellectual capital involves the quest in understanding the utility of Intellectual capital and its role in impacting the corporate performance. Intellectual capital can be defined as intellectual resources that have been "formalized, captured and leveraged" to create assets of higher value (Prusak, 1998). While getting tuned to the new economic reality of transformation into knowledge economy, it is logical to treat intellectual capital as a resource than as a cost (Pulic, 2004). In the era of knowledge economy, companies not only produce products and services, but are finding ways to create value addition and wealth from their own resources to build sustainable business organizations.

Today, companies visualize themselves as learning organizations and understand that knowledge assets enhance innovation and play a vital role in improving business performance. The developers of Resource – Based View of the firm, Birger Wernerfelt (1984) and Richard P. Rumelt (1984) maintains that both tangible and intangible assets are potential strategic assets. Resource based view of the firm encompasses the advantages of both tangible and intangible assets. This theory has gained wide acceptance in accounting, economic and management literature as it has been able to provide positive result linkages between resources of firms and measures of performance (Canibano *et.al,* 2000). Even though many intangible assets do not find a place in the list of vital strategic assets, intellectual capital is generally considered as pivotal since it comprises of specific and valuable knowledge solely belonging to an organization. There has been an explosion of interesting studies on intellectual capital since Stewart published an article on "Brainpower" (Stewart, 1991) in FORTUNE magazine in 1991. The firms competing in the knowledge based economy need to be valued differently since traditional measures of accounting may not suffice. (Botnis, 2001; Svieby, 2000, 2001; Pulic 1998, 2001; Edvinsson, 1997; Pablos, 2002) are of the view that traditional measures of financial performance are not enough to value knowledge firms. Companies need to improve their disclosure and reporting of intellectual capital and value creation strategies.

This study takes a broad analytical perspective on intellectual capital valuation by using Ante Pulic's VAIC™ index. This tool has been employed to measure the intellectual capital value creation efficiency of selected Indian Industries like Banking industry and Information technology industry which are highly intellectual capital intensive. Pulic's approach uses human capital (VAHU), Physical Capital (VACA) and structural capital (STVA) to measure the Intellectual ability of a company. This helps in understanding the relative importance of each component while measuring intellectual capital.

The result presents evidence on the relationship between intellectual capital and corporate performance by adopting PLS – Path Modeling technique. Finally this study presents evidence on the impact of intellectual capital on corporate performance and its predictive ability with respect to two industries studied. Also, the findings aid unsophisticated investors to better understand the changing face of Indian business and suitability of using intellectual capital for evaluating business performance. The study is organized as follows. The first part is Introduction to the study followed by Review of Literature, Research Framework and methodology. The last part is on findings and discussion of empirical analysis. From here onwards Intellectual Capital would be written as IC and Corporate Performance as CP.

2. REVIEW OF LITERATURE

Current literature on intellectual capital, theory framework and measurement find its origin from accounting and financial perspectives, focusing on the firm level analysis (Botnis et.al., 1999, 2000, 2002). Researches across the globe have tried to delineate the concept of IC and its constituents. The battle for acceptance of IC as an important concept for assessing modern organizations has been largely won.

2.1. Definition of intellectual capital

There are various definitions for intellectual capital. Researchers have tried to define and explore different facets of intellectual capital. But the general indication is that IC is a non-monetary asset without Physical existence but possesses value that can generate future earnings. Barney (1991) opines that intellectual capital is something which is intangible and is a major strategic asset capable

of generating sustainable competitive advantage and superior financial performance. Stewart (1997) defined IC as "packaged useful information". He has also stated that intellectual capital could be viewed as knowledge, information, intellectual property, experience that can be put to use to create wealth. Boudreau and Ramstad (1997) believe that IC is closely related to human resource management. According to Sullivan (2000) intellectual capital could be defined as knowledge that can be converted into profit. Rastogi (2003) opines that IC is the collaborative effort of a firm's human capital, social capital and knowledge management.

To summarize: Intellectual capital lacks physical form, It cannot exist on its own, but derives value from network effect, It is a claim on future assets.

According to IAS 38, IC (IA) has been defined to include expenditures on advertising and marketing, research and developmental activities, human resource expenditures, copy rights, franchises, future interest, licenses, operating rights, patent, record masters, secret processes, trademarks and trade names, organizational structure and values that come from brand names.

2.2. Intellectual capital and its components

By late 90's there were numerous groups of researchers which included accounting professionals, management practitioners and academicians who tried to categorize and classify IC. According to IAS 38, IC (IA) came forward with a classification for ICs and concluded that intangibles could be classified into three categories. Perhaps this would be the first categorization from a non-accounting perspective. Accordingly intangible asset could be classified into three sub-categories as follows: (1) Employee or individual competence (2) Internal structure.(3) External structure.

Another important definition for IC and its classification is offered by OECD (1999) which described Intellectual capital as the economic value of two categories of intangible assets. They are (i) Organizational (structural) capital –SC.(ii)Human capital(HC).

Human capital includes resources within organization and resources like customers partners, suppliers which are external to organization. The SC refers to proprietary software systems, distribution networks and supply chains. Edvinsson and Malone (1997) view intellectual capital as being composed of two components.
- *Human capital*: includes knowledge skill and experience of employees.
- *Structural capital*: includes the embodiment, empowerment and supportive infrastructure of human capital.

Structural capital is divided into Organizational capital and customer capital which is further divided into Process capital and Innovation capital. MERITUM (2002) – THE MEASURING OF INTANGIBLES TO UNDERSTAND AND IMPROVE INNOVATION MANAGEMENT for the measurement of intangibles within a firm in their MERITUM Project 6 used Sveiby's model and classification which categorizes IC into human resources, structural resources and relational resources. FASB NN (2001) categorizes Intellectual capital as intellectual assets for financial reporting.

They include Technology (1) Customer Market (2) Workforce (3)Contract (4) Organization (4) Statutory based assets Andriessen and Stem (2004) are of the opinion that IC could be broken down into three categories like human resources, organizational resources and relational resources. In the words of Youndt *et.al* IC consists of (1) Human capital (2) Organizational capital (3) Social Capital. They further explain that IC is the sum of all knowledge that an organization is able to leverage in the process of conducting business to gain competitive advantage.

2.3. Measurement of intellectual capital

There has been a plethora of proposed methods and theories to measure intangible assets or intellectual capital. The biggest hindrance in measurement of intellectual capital is the fact that intangibles are difficult to quantify and are very expensive. The results of measurement are uncertain as it has been arduous to measure a social phenomenon close to scientific accuracy. There is no accepted methodology for valuation of intellectual assets and this has led to numerous efforts by researchers. Most of the valuation methods of intellectual capital falls under four basic categories:

(1)Direct Intellectual capital Methods (DIC) (2) Market Capitalization Methods (MCM) (3) Return on asset methods (ROA) (4) Scorecard Methods (SC).

2.4. Value added intellectual capital – VAIC™.

Management practitioners and researchers agree that the existing measuring systems will not be able to measure intellectual capital flawlessly. Since the upcoming business models are based more on intangibles, it's become inevitable. Taking this into consideration, the importance of IC in value creation, Ante Pulic along with his colleagues at the Austrian IC Research centre developed a new method to measure the IC of companies which they called as "Value Added Intellectual Coefficient" – VAIC™. This method is very significant since it helps us to measure the value creation efficiency of both tangible and intangible assets of an organization. The strength of VAIC™ method is its ability to assess the IC within an organization. Pulic (2000a, b) argued that market value of an organization is created by IC and capital employed of which the former consists of Human capital and Structural Capital. Unlike traditional accounting which focuses on controlling cost, Pulic (2000b) focused on value creation and he opined that two resources namely capital employed and intellectual capital creates value addition for an organization. This method utilizes the value creation capability of two primary sources –physical capital resource and IC resources. It assumes that IC cannot exist in isolation nor can it derive value alone. Only when it combines with physical capital can it generate value. This method is different and can be distinguished from other methods since it indirectly measures IC (VAIC) by summation of Capital Employed Efficiency (VACA), Human capital efficiency (VAHU) and structural capital efficiency (STVA).

2.5. Calculation of VAIC™

This is a measurement system based on the real value and performance of a company, region or nation thus helping in benchmarking and predicting future capabilities. Ante Pulic developed Value Added Intellectual Coefficient VAIC™ (Ante Pulic 1998, 2000, 2000a, b) to measure intellectual capital value creation. VAIC™ measure is calculated as follows:

$$VAIC™ = VACA+VAHU+STVA$$

3. RESEARCH FRAMEWORK

Value of intellectual capital would tend to become a mouthpiece for company's performance. Keeping research objectives in mind the study proposes the following Research frame work to investigate the relationship between Intellectual capital and corporate performance.

Figure 1: Diagrammatic representation of Research Framework
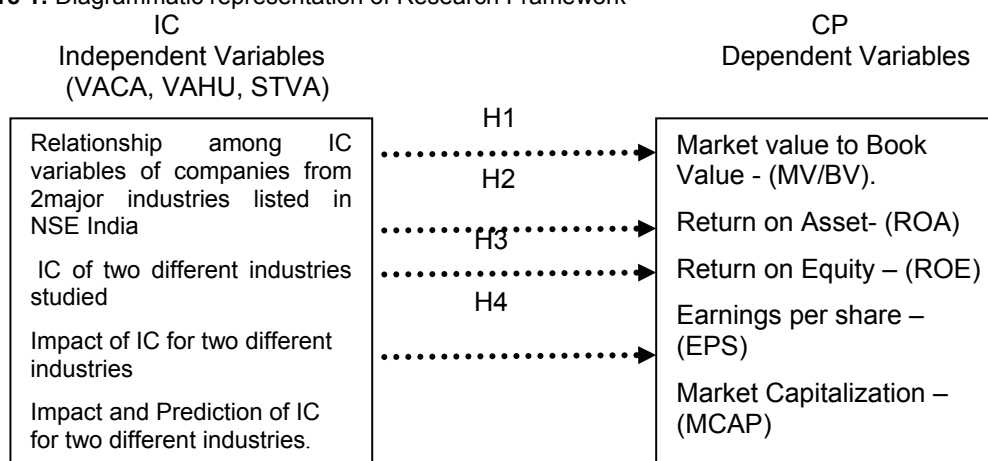

Conceptual model of research framework using partial least square –path modelling

In this PLS–PM model Intellectual Capital and Corporate Performance are treated as latent variables. Intellectual capital has three indicators VACA, VAHU and STVA and corporate performance has MV/BV, ROE, ROA, EPS and MCAP as indicators. Hence we draw up a formative model for this

study. Such kind of analysis cannot be given by a multiple regression model and hence PLS-PM has been adopted for this study

Figure 2: Conceptual Model
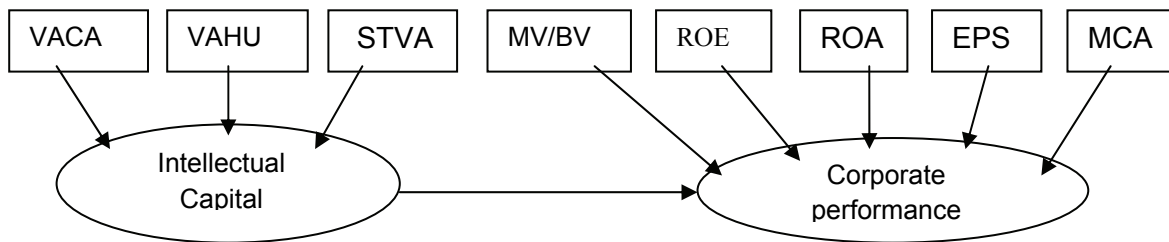
This method is highly recommended in case were formative than reflective models are studied. It is also useful in case of studies like this where theories are yet to be firmly defined. Moreover PLS-PM is less sensitive to mis-specifications.

3.1.   Research objectives and hypothesis development

Intellectual capital plays a pivotal role in the success of all kinds of organizations, that is to say that it is not confined to knowledge – enterprises alone. Studying the relationship between intellectual capital and traditional counterparts in financial performance evaluation makes an interesting research proposition. The invisible value omitted from financial statements has drawn wide research attention. Instead of directly measuring intellectual capital Pulic (2000a, b) has proposed Value Added Intellectual Coefficient – VAIC™ to find out the efficiency of value added by the intellectual capital.

In the above context, the objectives of the research paper could be defined as follows:
- *To estimate, evaluate and rank the Intellectual capital efficiency measured by VAIC™ for the two industries studied.*
- *To study the significant relationship between IC variables and CP variables.*
- *To explore the differences among various industries with regard to intellectual capital and corporate performance*
- *To study the multivariate relationship and impact among observed variables that measure intellectual capital and corporate performance and study their predictive relevance.*

Hypotheses Development:

The present study introduces a conceptual frame work that expands on previous methodologies (Botnis et al.2000; Chen et al.2005; Firer and Williams, 2003; Maditinos et al 2011; Riahi-Belkaoui (2003); Tan et.al 2007; Pulic 2000a, b) to investigate the relationship between IC and corporate performance and study the impact if IC on corporate performance. The hypotheses of the study are presented below:
H1: There is significant relationship between various measures of IC (Intellectual Capital) and CP (Corporate Performance) variables
H2: There is significant difference among the two industries with regard to variables like VACA, VAHU and STVA which measures IC.
H3: There is a significant impact of Intellectual Capital on Corporate performance
H4: Intellectual Capital performance can predict corporate performance

The last two hypotheses use multivariate analysis using PLS-PM. As per this method impact of the variables of one over another is measured by R2 of the latent variable which shows the validity and strength of the model.H4 intends to look at the predictive ability of the model –which means the relevance of latent variable in explaining endogenous variable. H3 assesses the inner model, where as H4 analyses the total model predictability.

3.2.   Variable definition

Two sets of variables have been identified for the purpose of this study. They include variables which measure intellectual capital which are treated as independent variables and variables which measure

corporate performance which are dependent variables. Independent variables used in this study are derived from Pulic's method. Under this method the measure of IC would be determined using three comprehensive measures VACA, VAHU and STVA. Dependent Variables for the purpose of this study five financial ratios have been used as proxies for company performance. They include MV/BV ROE, ROA, EPS, and MCAP.

The Market-to-book value ratio is simply calculated by dividing the market value (MV) with the book value (BV) of common stocks.
ROE = Net Income / Shareholder's Equity
ROA = Net Income/Total Assets.
EPS = Net Income – Dividends on Preferred stock / Average Outstanding Shares
Market Capitalization: Shares Outstanding*Market price of these shares

3.3. Research tools

In order to accomplish the research objectives a mixed approach has been used to study the relationship between variables measuring intellectual capital efficiency and corporate performance various tools has been used for this study .They include Correlation Analysis, One way ANOVA and PLS-Path Modeling.

3.4. Data source

Data for the study are collected from Centre for Monitoring Indian Economy (CMIE) – Prowess. CMIE is an independent economic think-tank headquartered in Mumbai – India and has the largest data base on Indian economy and companies. The database is normalized to enable intercompany and inter-temporal comparisons.

4. EMPIRICAL ANALYSIS AND DISCUSSION

4.1. Sample selection

The study begins by identifying industrial sectors heavily reliant on intellectual capital. The data covers two major Indian industrial sectors namely Banking, Information Technology. All the companies chosen for study are listed and publicly traded on National Stock Exchange (NSE) in India during 2000 – 2010. Taking into account the study's longitudinal objective the time period established for this study is from 2000 to 2010 (11 years). Researcher believes that 11 years is enough time to account for common environmental and economic changes and shift in industrial business cycle that can impact changes in the performance of firm and industry. Moreover the study span over a decade has been helpful in establishing the consistency and predictability of research conclusions.

In order to ensure that data is useful for research purpose two sample selection criteria has been followed. The selection principles include (a) complete target information (b) excluding unusual information (this includes negative income, misreported or omitted data) Final sample consists of total 319 eleven year observations

Table 1: Sample selection procedure

		Firm years
Listed companies (2000 – 2010)		1106
Less: Key variables omitted	198	
Less: Negative Income	206	
Less: Misreported/missing data	383	
Final Sample (Total)		319

Table 2: Sample selection and sample firms' profile and distribution by industry

Industry	Firm years	Percentage sample
Banking	176	55.18
Information Technology	143	44.82
TOTAL	319	100

4.2. Descriptive statistics

Table 3 presents the mean, standard deviation of the independent and dependent variables studied. The mean value of VAIC for the banking sector for all the years together is 11.08. This shows that banking industry has been successful in creating value from intellectual capital. It has generated a value of 11.08 rupee for every one rupee invested. The other value creation efficiency indicators like VACA, VAHU, STVA has a mean value of 0.71, 9.51 and 0.86 respectively. The mean value of human capital efficiency of 9.51 indicates the high quality of human resources employed by the banking sector. Moreover being a high profile service industry, human capital has been a major contributor for overall excellence in the performance of this industry. The MV/BV ratio of 1.57 reveals that about 36% of the banking firm's market value is not reflected in financial statements. The overall financial performance is sound as indicated by the high EPS ratio of 31.21.The other financial indicators like ROE, ROA and MCAP have mean value of 0.17, 0.01, 10.09.

Table 3: Industry wise descriptive statistics for selected variables

Industry		VACA	VAHU	STVA	VAIC	MV/BV	ROE	ROA	EPS	MCAP
Bank	Mean	0.71	9.51	0.86	11.08	1.57	0.17	0.01	31.21	10.09
	SD	0.41	6.73	0.09	6.74	1.61	0.06	0.01	29.95	1.80
IT	Mean	0.80	2.16	0.45	3.41	6.93	0.22	0.15	24.21	9.01
	SD	0.48	1.15	0.18	1.10	18.48	0.11	0.08	27.78	2.67

Mean value of VAIC for IT industry reveal that Value addition brought about by VAIC is about 3.41. The information technology industry has been able to produce only 3.41 value addition for every one rupee invested. The other indicators of efficiency have mean value of 0.8 for VACA, 2.16 for VAHU and 0.45 for STVA. The highest value enhancer of intellectual capital is human capital. Mean value of Financial performance variables indicate the overall financial soundness of this sector. This is highlighted by the reasonably high value of mean EPS which is 24.21. ROE, ROA and MCAP has recorded mean values of 0.22, 0.15, and 9.01. The mean ratio of 6.93 for MV/BV shows that 85.56% of firm's value is hidden and not captured in the financial report

The above analysis reveals a big contrast in VAIC™ values of Information technology Sector and Banking sector. Values of intellectual capital efficiency indicator VAIC ™ suggests sample companies were capable of creating value from intellectual capital base. Comparison of mean values of VACA, VAHU and STVA of different industries suggest that the sampling industries has been able to create values from human capital employed than from physical or structural capital. This proves that high-quality human resources has been the backbone for efficienct utilization of intellectual capital assets . The Mean ratio of Market to Book value (MV/BV) of the two industries highlights the existence of an increasing gap between market value and book value of organizations. This may be due to the poor valuation of intellectual capital. In the case of high-tech and knowledge based industries where huge amounts are invested in intellectual capital components like, R&D, Patents, and network.

4.3. Correlation analysis and verification of hypothesis I

Table 4 presents the Pearson's Correlation analysis for the dependent and independent variables in this study. Correlation measures the relationship between two variables and explains the linear relationship between them.

Tabel 4: Correlation analysis for selected variables Correlation matrix (Pearson):

Variables	VACA	VAHU	STVA	MV/BV	ROE	ROA	EPS	MCAP
VACA	1	-0.086	-0.307	0.057	0.391	0.167	0.060	-0.096
VAHU	-0.086	1	0.674	-0.079	-0.145	-0.346	-0.047	0.108
STVA	-0.307	0.674	1	-0.094	-0.098	-0.382	0.110	0.240
MV/BV	0.057	-0.079	-0.094	1	0.208	0.234	0.007	0.242
ROE	0.391	-0.145	-0.098	0.208	1	0.700	0.321	0.121
ROA	0.167	-0.346	-0.382	0.234	0.700	1	0.191	0.074
EPS	0.060	-0.047	0.110	0.007	0.321	0.191	1	0.327
MCAP	-0.096	0.108	0.240	0.242	0.121	0.074	0.327	1

VACA shows significant positive relationship with ROE (.391) and ROA (.167) but shares a negative relationship with MCAP (-.096). This demonstrates that an increase in value creation efficiency by physical capital would influence profitability. VAHU or human capital efficiency has significant positive association with MCAP (0.108) but not with ROE (-.145) and ROA (-.346). STVA - structural capital efficiency shows significant positive relationship with EPS (0.110) and MCAP (0.240), but is negatively correlated to ROE (0-.098) and ROA (-0.382). Thus it has been concluded that physical capital shows significant positive correlation with ROE and ROA human capital shows significant positive correlation with MCAP and structural capital shows significant positive correlation with EPS and MCAP. Thus the hypotheses H1 stands partly accepted.

4.4. Verification of hypotheses II

Hypothesis II states that there is a significant difference among the four industries with regard to the intellectual capital variable which includes VACA, VAHU and STVA. One way ANOVA has been conducted to determine whether intellectual capital performances of different industries are statistically different.

Table 5: Summary of intellectual capital variables

	VACA	VAHU	STVA
R²	0.169	0.290	0.560
F	39.333	78.829	245.578
Pr > F	< 0.0001	< 0.0001	< 0.0001
Industry	39.333	78.829	245.578
	< 0.0001	< 0.0001	< 0.0001

 Highlighted values represent significance at 95% C.I

The test used here is the Fisher's F test. Given that the probability corresponding to the F value in this case is 0.001, it means that we would take a 0.1% risk to conclude that the null hypothesis (no effect of industries on IC variables) is wrong. Thus from the above analysis it is clear that we reject the null hypotheses and accept the alternate hypotheses. In order to know how group means differ from each other, Post-Hoc test (multiple comparison test) has been done. Tukey's (HSD) test has been done to answer the above questions. Table 6 shows the analysis of difference between categories.

Table 6: Industry/ Tukey (HSD)/Analysis of differences between categories with a confidence interval of 95 %

Contrast	Difference	Standardized difference	Critical value	Pr > Diff	Significant
BANK vs. IT	0.405	26.418	2.569	< 0.0001	Yes
Tukey's d critical value:		3.633			

Table 7: Category grouping using LS means

Category	LS means	Groups	
BANK	0.855	A	
IT	0.450		B

As shown in the table 6 the Tukey's HSD (Honestly Significantly Different) test has been applied to pair wise difference between means. The risk of 5% has been chosen to determine the critical value q, which is then compared to the standardized difference between means. Thus it is clear from the above analysis that the two industries are different from each other pairs are significantly different from each other. Category grouping which also makes it clear that IC variables of two industries chosen for study are significantly different. It has been concluded with confidence that there is statistically significant difference among the two industries with regard to intellectual capital performance. Thus hypotheses H2 stands fully accepted.

4.5. Verification of hypotheses H3 and H4

In order to study the multivariate relationship among the observed variables that measure intellectual capital and corporate performance PLS-path modeling method has been used
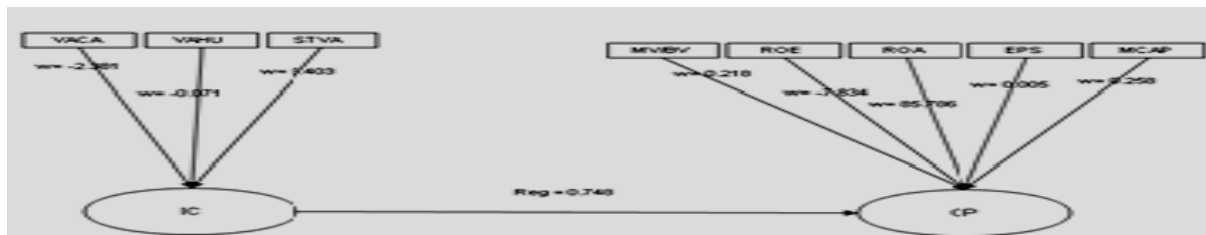
Figure 3: PLS-PM for banking industry

Table 8: Multicollinearity Statistics

Statistic	MV/BV	ROE	ROA	EPS	MCAP	VACA	VAHU	STVA
R²	0.130	0.660	0.641	0.219	0.224	0.350	0.499	0.629
Tolerance	0.870	0.340	0.359	0.781	0.776	0.650	0.501	0.371
VIF	1.150	2.944	2.782	1.281	1.289	1.539	1.997	2.693

Above table reveals that VIF values of all variables are less than 10 and hence it has been concluded that there is no harmful multicolinearity among the variables selected for study

Table 9: Results for PLS-path modeling for Banking industry

MEASUREMENT	INDICATOR	RESULT	SIGNIFICANCE OF THE INDICATOR	INTERPRETATION
Goodness of fit	Relative GoF index	Relative GoF index has value of 0.816	GoF is a single measure for the overall prediction performance of the model	Value of relative GoF close to 0.9 or higher than are considered to speak in favor of the model
Cross loadings	Mono factorial cross loadings	Variable-(IC/CP) VACA-(-0.92/-0.688) VAHU-(-0.023/-0.017) STVA-(0.212/0.158) MV/BV-(0.483/0.647) ROA-(-0.372/-4.98) ROE-(0.260/0.348) EPS-(0.179/0.240) MCAP-(0.543/0.726)	Checks whether the manifest variables are related to latent variables or to some other latent variable	The model is well specified i.e the manifest variables measure the latent variables conclusively.

MEASUREMENT	INDICATOR	RESULT	SIGNIFICANCE OF THE INDICATOR	INTERPRETATION
R^2 values of endogenous LV's	Inner model specification.	$R^2 =0.56$	R2 values of 0.6,0.33, or 0.19 for endogenous latent variables in the inner path model are described as substantial, moderate, or weak by Chin (1998,p.323).	R^2 of .56 can be considered as a good result. We can conclude that IC has good impact over CP. It also confirms the underlying theory.
Path Coefficient	Regression weight of the path	0.748		
t-statistic		14.854		The t –statistic of the regression weight is more than 1.96. This means that loading is significant at P<.05 level.
Model Predictive Value	R^2 Adjusted	0.559		
Multicolinearity	Variance Inflation Factor (VIF) value	MV/BV-1.15 ROE- 2.94 ROA -2.78 EPS- 1.28 MCAP 1.28 VACA 1.54 VAHU 1.99 STVA 2.69	Rule of thumb states that VIF greater than 10 reveals a critical level of multicolinearity	Typical problems of multicolinearity not detected for the formative indicators

The above table shows the various measurement aspects of PLS-PM model and its interpretations.

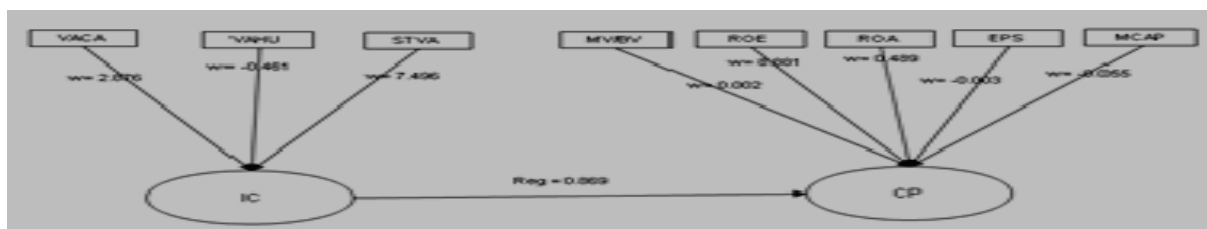**Figure 4:** PLS-PM for Information Technology Industry

Table 10: Results for PLS-path modeling for IT industry

MEASUREMENT	INDICATOR	RESULT	SIGNIFICANCE OF THE INDICATOR	INTERPRETATION
Goodness of fit	relative GoF index	Relative GoF index has value of 0.69	GoF is a single measure for the overall prediction performance of the model	Value of relative GoF close to 0.9 or higher than are considered to speak in favor of the model
Cross loadings	Mono factorial cross loadings	Variable-(IC/CP) VACA-(0.762/0.662) VAHU-(-0.087/-0.076) STVA-(-0.077/-0.067) MV/BV-(0.179/0.206) ROE-(-0.858/0.987) ROA-(0.706/0.812) EPS-(0.308/0.354) MCAP-(0.130/0.150)	Checks whether the manifest variables are related to latent variables or to some other latent variable	The model is well specified i.e. the manifest variables measure the latent variables conclusively.

MEASUREMENT	INDICATOR	RESULT	SIGNIFICANCE OF THE INDICATOR	INTERPRETATION
R^2 values of endogenous lv's	Inner model specification.	R^2 =0.76	R2 values of 0.6,0.33, or 0.19 for endogenous latent variables in the inner path model are described as substantial, moderate, or weak by Chin (1998,p.323).	R^2 of 0.76 can be considered as a good result. We can conclude that IC has good impact over CP. It also confirms the underlying theory.
Path coefficient	Regression weight of the path	0.87		
T-statistic		20.9		The t –statistic of the regression weight is more than 1.96. This means that loading is significant at P<.05 level.
Model predictive value	R2 Adjusted	0.76		
Multicolinearity	Variance Inflation Factor (VIF) value	MV/BV-1.15 ROE- 2.94 ROA -2.78 EPS- 1.28 MCAP 1.28 VACA 1.54 VAHU 1.99 STVA 2.69	Rule of thumb states that VIF greater than 10 reveals a critical level of multicolinearity	Typical problems of multicolinearity not detected for the formative indicators

The above table shows the various measurement aspects of PLS-PM model and its interpretations.

5. FINDINGS AND CONCLUSION

This study assesses the relation between Intellectual capital and corporate performance. The uniqueness of this study lies in the fact that an in depth analysis has been done to understand the impact and predictive ability of intellectual capital on corporate performance using PLS –Path Modeling. With respect to VAIC™ ranking Banking Sector tops with mean value of 11.08 for VAIC™ and Information Technology Industry with a VAIC of 3.41.Comparison of mean values of VACA, VAHU and STVA of two industries suggest that the sampling industries were able to create values from human capital employed than from physical or structural capital. The Mean ratio of Market to Book value (MV/BV) of the two industries highlights the existence of an increasing gap between market value and book value of companies sampled. 85.56%of Information technology firm's market value are underrated when compared to bank. MV/BV of banking industry reveals that about 36% of the banking firm's market value is hidden from financial statements. Remarkable disparity between market value and book value may be due to poor valuation of intellectual capital. Knowledge Centric companies have huge hidden values which are not visible to traditional accounting methods and divergence specifically indicates something not accounted in the balance sheet. Fischer's F-test proves that there is significant difference among the two industries with regard to Intellectual Capital variables. Post-Hoc test (multiple comparison test) Tukey's (HSD) test shows that the two industries (banking and IT) in the pair are significantly different. The category grouping makes it clear that Intellectual Capital of two industries chosen for study is significantly different.

The PLS-PM model for banking and Goodness of fit – GoF index values for banking, IT and industries are as 0.82, 0.69, respectively. These values speak in favor of the model. In case of IT industry the value is less compared to banking industry. Cross loading results for the two industries show that manifest variables VACA, VAHU and STVA are more loaded in its own latent variable Intellectual capita(IC) than Corporate Performance (CP) and manifest variables MV/BV, ROE, ROA, EPS, and MCAP are loaded more on its latent variables CP than IC. Hence we can conclude that manifest variables measure the latent variables conclusively.

The R^2 value of the endogenous variable has values of 0 .56, 0.76, respectively for bank, Information technology. This shows the inner specification of the model and also explains the variance. I.e. in case of banking industry 56% of the variance in corporate performance is caused by Intellectual capital. The highest impact is found in IT industry. Regression weights of the path coefficient for the two industries show a t-statistic value of more than 1.96. Hence the path coefficient is valid and significant with respect to the two industries studied. The relative impact of predictive relevance is found by blind folding redundancies. The values range from 0.153 for banking industry and .276 for IT. We can conclude that there is medium predictive relevance for these two industries.i.e Intellectual capital performance is relevant and helps to improve corporate performance.

6. CONCLUSION

This research provides a different dimension for the study on intellectual capital by analyzing the impact of Intellectual capital on corporate performance. The analysis has been undertaken using PLS-Path Modeling. PLS –PM is considered as an apt tool for this study because of sample size, non-normal distribution of data, use of formative model and such a study has not been conducted in Indian context. The model gives strong support for the underlying theoretical underpinnings on IC. PLS analysis explains a good model fit and theoretical confirmation of the conceptual model. This study suggests that those theories and practices that place high value to IC are strongly supported and appreciated. Moreover it provides evidence that VAIC™ model proposed by Ante Pulic is a valid tool for measuring intellectual capital. The higher impact if IC on CP is found in Information technology industry, and less in banking industry. It is evident from the results that for knowledge centric industries IC is crucial and affects the corporate performance more than a service industry like Bank. This study breaks the monotony of assessing business organizations through the lens of financial performance alone. It provides evidence that the Business performance is not only a result of heavy top line and bottom line figures, but many factors which are intangible can impact corporate performance in a big way. This study is highly relevant for a country like India as this paper proves that Human capital is the key factor that contributes towards the intellectual capital excellence. Rather than fixed assets, intangibles assets – especially Intellectual Capital have now become the value drivers of organizations.   More transparent measurement and reporting of Intellectual capital will help organizations and stake holders to value the organizations better.

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