



## Evaluation of Financial Performance Using Intellectual Capital: A Case Study of Pakistani Banks

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**Abstract:** The main purpose of every organization is striving to have a competitive advantage over others. To achieve this, intellectual capital can be the best alternative, which is measured in different ways but, in this study, Value Added Intellectual Coefficient (VAIC) was used and compared with profitability ratio (i.e., return on assets (ROA)). Data from 2007 to 2014 was collected from 14 banks (regardless of their size) operating in Pakistan. It was found that there is a significant association between both dependent and explanatory variables. The results indicated that financial performance of the banks was much affected by Human Capital Efficiency (HCE) and Structural Capital Efficiency (SCE). In determining the Intellectual Coefficient value, HCE was the main contributor. It was observed that HCE has much influence in determining profitability of the banks operating in Pakistan, but to maintain their consistency in profits, banks should equally focus on other components, i.e., SCE and CEE, of intellectual capital.

**Key words:** Pakistani banking sector, Capital employed efficiency, Structural capital efficiency, Financial evaluation of banks, Return on assets.

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### INTRODUCTION

All the institutions, established for whatever purpose, solemnly depend on both financial and human resources. Financial resources may be considered as the key, without which no institution can execute work/operations. On the other hand, human capital also plays a vital role for the success of a business and, in human capital, Strategic Human Resources play a vital role in taking business at its boom.

It is well known that the organizations in this era are operating in an intense competitive environment. Organizations are now becoming consumer oriented and are seeking customers' loyalty, which has made it necessary for them to rebuild their strengths and overcome their weaknesses. Rebuilding their strengths needs them to obtain maximum optimal level, which can be attained through specialized operations, efficient human resources and maximum utilization of resources. Among these, a newly

debated factor for success is Intellectual Capital, which has been discussed and researched by different individuals. Kamath (2007) studied that intellectual capital can be the major element to obtain competitive advantage by a firm over its rivals.

Intellectual capital has been defined by different researchers and academicians as an intangible asset (including human resources, organization structure and core values), which does not appear on the balance sheet but imparts positive impact on institution's value (Edvinsson, 1997). Itami (1987) is considered as the first contributor of intellectual capital definition, saying it comprises intangible assets including customer loyalty, advance technology, brand, and good will, etc. Steward (1997) said that intellectual capital was composed of structural, human and customer capital. Further dividing, he said that human capital included specialized operations, integrated efforts and defined methods. Human capital included skilled labour, employee's efficiency and turnover rate; customer

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capital involved consumer's satisfaction and its loyalty.

Academicians and researchers have not yet decided upon the mechanism of intellectual capital but it is thought that it includes human capital having skills, expertise, knowledge and experience; structural capital having good organizational structure, efficient operations/processes and core values/consumer capital (Mondal and Ghosh, 2012). According to them, consumer capital includes relationship with customers, suppliers and other stakeholders. According to Tsen and Hu (2010), without investing in intangible assets, it is impossible for an organization to attain optimal level and gain momentum.

### 1. Measures of intellectual capital

Different kinds of techniques are used by different researchers to find the true value of intellectual capital, which includes Tobin's ratio, Market to Book ratio (Steward, 1997), intellectual capital service's directory (Roos *et al.*, 1997), Skandia Intellectual Capital Navigator (Edvinsson, 1997), balanced score card (Kaplan and Norton, 1996), economic value added (Steward, 1991), the audit of technology Broker's Intellectual Capital (Brooking, 1996) and frequently used methods by different researchers, for example, VAIC model (Pulic, 1998; Pulic, 2004; Çelikkol, 2008; Karacan and Ergin, 2011; Yalama and Coskun, 2007).

The model developed by Pulic (2000) to measure intellectual capital is a widely used model, in which he stated that a firm's value is produced by intellectual capital and capital employed, whereas intellectual capital includes structural capital and human capital. In his model, he used both tangible and non-tangible assets to find co-efficient of value creation, i.e. VAIC, using co-efficient of capital employed, co-efficient of human capital and co-efficient of structural capital. In comparison to other models, the simplicity and applicability of this model makes it more ideal to apply (Maditinos *et al.*, 2011).

Tan *et al.* (2007) also used VAIC method to evaluate intellectual capital to find financial performance of companies listed at Singapore Stock Exchange. In his study, he evaluated the association between financial performance and intellectual capital and found that there is a direct association between the two.

Samiloglu *et al.* (2006) used VAIC as a factor of intellectual performance to find the financial evaluation of Turkish banks. The consequences indicate that there is a significant association between both dependent variables (ratio of market to book value) and independent variables, i.e., VAIC. Another study was conducted by Firer and Williams (2003), the association between intellectual capital and commercial performance of African firms, who discussed and reported that there is no significant correlation between them. Zehri *et al.* (2012) also

used VAIC model to determine the association of intellectual capital and financial performance in Tunisia. In this study, VAIC was utilized as strength of intellectual capital and the organization's performance was measured by ROA (Return on Assets) and Operating Margin and Market Evaluation (Market to Book Ratio). The results showed positive relationship between intellectual capital and financial as well as economic performance of the organization.

### 2. Hypothesis of the study

The proposed hypotheses assume that there is a direct association between the following:

H<sub>1</sub>: Banks' performance and VAIC

H<sub>2</sub>: Banks' performance and HCE

H<sub>3</sub>: Banks' performance and SCE

H<sub>4</sub>: Banks' performance and CEE

## METHODOLOGY

In this study, secondary data for the period 2007 to 2014 has been used. A sample of 14 banks; both conventional and Islamic banks operating in Pakistan, has been taken, using random sampling. VAIC was used to determine the Intellectual Capital and was regressed over measure of financial performance, i.e., ROA (Return on Assets). The model used in this study has also been used by other researchers (Lipunga, 2014; Joshi *et al.*, 2013; Isanzu, 2015; Ozkan *et al.*, 2016).

### 1. Explanatory variables

Components of VAIC model (Pulic, 1998, 2004; Yalama, 2013; Ghosh and Mondal, 2009) are used as explanatory variables;

$$VAIC_j = HCE_j + SCE_j + CEE_j$$

Whereas, VAIC refers to value added intellectual coefficient of bank j, HCE refers to human capital efficiency of bank j and SCE refers to structural capital efficiency of bank j and CEE refers to capital employed efficiency of bank j.

In order to determine these components, the total value added (VA) needs to be calculated for each bank (Chu *et al.*, 2011; Al-Musalli and Ismail, 2014).

$$VA = OP + EC + A$$

OP = Operating Profit

EC = Employment Cost.

A = Cost of Depreciation and Amortization

Further dividing components;

HCE = VA/HC (HC means Human Capital or Personnel Expenses)

SC = VA-HC (SC means Structural Capital)

SCE = SC/VA

CEE = VA/CE (CE means Capital Employed)

### 2. Explained variable

The return on assets (ROA) is a financial ratio utilized to calculate profitability and efficient use of its assets employed (Total Income/Total Assets).

**3. Regression models**

Equation 1:  $ROA_{jt} = \beta_0 + \beta_1 VAIC_{jt} + \varepsilon$

Equation 2:  $ROA_{jt} = \beta_0 + \beta_1 HCE_{jt} + \beta_2 SCE_{jt} + \beta_3 CEE_{jt} + \varepsilon$

**RESULTS AND DISCUSSION**

The empirical results show (Table 1) that Muslim Commercial Bank has the highest average VAIC value, i.e., 8.67 among other Pakistani banks and the lowest average VAIC value (4.39) was shown by the

Bank of Punjab. It has been observed that the main contribution in VAIC value was of HCE component. The result is in line with other studies (Goh, 2005; Joshi *et al.*, 2013; Ozkan *et al.*, 2016).

Table 2 shows that mean VAIC of all the banks takes a value of 5.90 and deviates at 1.25, among the components of VAIC, and HCE takes the highest value (with mean of 4.45 and st. deviation 1.08). SCE takes smaller value with mean 0.75 and deviation 0.11 about its mean.

**Table 1: Mean value of VAIC and its components.**

Name of bank	CEE	SCE	HCE	VAIC
Habib Bank	0.72	0.78	4.49	5.99
Muslim Commercial Bank	0.57	0.83	7.27	8.67
National Bank of Pakistan	0.54	0.74	4.00	5.28
United Bank	0.70	0.83	6.05	7.59
Askari Bank	0.85	0.70	3.61	5.15
Bank Al Habib	0.96	0.82	5.52	7.30
Bank of Khyber	0.29	0.71	3.91	4.91
Bank of Punjab	0.63	0.56	3.21	4.39
Faysal Bank	0.77	0.76	4.12	5.65
Albaraqa Bank	0.63	0.78	4.49	5.90
Meezan Bank	0.91	0.79	4.76	6.46
Bank Islami	0.59	0.76	4.19	5.54
Dubai Islamic Bank	0.63	0.73	3.82	5.19
Bank Al-Falah	1.03	0.76	4.17	5.96
<b>Average</b>	<b>0.70</b>	<b>0.75</b>	<b>4.55</b>	<b>6.00</b>

Source: Author’s research.

**Table 2: Descriptive Statistics.**

Indicator	N	Minimum	Maximum	Mean	Standard deviation
ROA	112	-9.05	5.46	1.32	1.91
HCE	112	1.25	7.39	4.45	1.08
CEE	112	0.10	1.11	0.70	0.22
SCE	112	0.20	0.86	0.75	0.11
VAIC	112	1.88	8.79	5.90	1.25
Valid N (list wise)	112				

Source: Author’s Research

Table 3 shows that there is a significant direct association between ROA and VAIC (0.78) along with its components, whereas, the correlation is high and positive in HCE (0.79) and SCE (0.82), while CEE showed relatively low correlation (0.31) with

ROA. Relation of VAIC with its sub-measures is very strong to HCE (0.98) and SCE (0.87) but it is positive and weak with CEE (0.37). It is also very important to note that both HCE and SCE have shown strong positive correlation (0.84) with each other.

**Table 3: Correlation between dependent (ROA) and independent variables.**

		ROA	HCE	CEE	SCE	VAIC
ROA	Pearson Correlation	1	0.794(**)	0.135	0.821(**)	0.789(**)
	Sig. (2-tailed)		0.000	0.157	0.000	0.000
HCE	Pearson Correlation	0.794(**)	1	0.195(*)	0.845(**)	0.981(**)
	Sig. (2-tailed)	0.000		0.040	0.000	0.000
CEE	Pearson Correlation	0.135	0.195(*)	1	0.279(**)	0.374(**)
	Sig. (2-tailed)	0.157	0.040		0.003	0.000
SCE	Pearson Correlation	0.821(**)	0.845(**)	0.279(**)	1	0.875(**)
	Sig. (2-tailed)	0.000	0.000	0.003		0.000
VAIC	Pearson Correlation	0.789(**)	0.981(**)	0.374(**)	0.875(**)	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	

Source: Author’s research. (\*): Significances level at 5 percent; (\*\*): Significant level at 1 percent.

Table 4 (a, b) depicts that there is a significant association between VAIC and profitability ratios of the banks. Value of R square and adjusted R square also demonstrates that the model is a good fit and it

explains 78.9% of variation in ROA relative to VAIC. These results are in contrast to those reproduced by Maditinos *et al.* (2011) and Ozkan *et al.* (2016).

**Table 4 (a): Model summary showing relationship between VAIC and ROA.**

Model	R	R square	Adjusted R square	Standard error of the estimate
1	0.789(a)	0.622	0.619	1.18184

a. Predictors: (Constant), VAIC.

**Table 4 (b): ANOVA (b) showing relationship between VAIC and ROA.**

Model		Sum of squares	Degree of freedom	Mean square	F-Statistics	Sig.
1	Regression	253.149	1	253.149	181.243	0.000(a)
	Residual	153.641	110	1.397		
	Total	406.790	111			

(Predictors: Constant, VAIC; Dependent variable: ROA)

From Table 5 (a and b), it can be concluded that components of VAIC (HCE, SCE, CEE) has also significantly affected profitability of banks (ROA) and showed 84% variation relative to its predictors

(HCE, CEE, SCE). This result is also supported by the studies conducted by other researchers (Chen *et al.*, 2005; Ozkan *et al.*, 2016; Joshi *et al.*, 2013).

**Table 5 (a): Model summary showing relationship between ROA and HCE, CEE, and SCE.**

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.846(a)	0.716	0.708	1.03450

(Predictors: Constant, HCE, CEE, SCE)

**Table 5 (b): ANOVA (b) showing relationship between ROA and HCE, CEE, SCE.**

Model		Sum of squares	Df (degree of freedom)	Mean square	F statistics	Significance.
1	Regression	291.208	3	97.069	90.702	0.000(a)
	Residual	115.581	108	1.070		
	Total	406.790	111			

(Predictors: Constant, HCE, CEE, SCE; Dependent variable: ROA)

### CONCLUSION

A number of studies have been carried out in different countries in different sectors to determine the association of intellectual capital and financial performance. Current study focuses on small, medium and large banking sector of Pakistan. Findings in this study showed that there was a significant direct association between intellectual capital and financial performance of banks, which is supported by the reported literature on the subject. The components (HCE and SCE) of intellectual capital have also strong relationship with profitability except CEE, which also showed positive but weak relationship. It is found that the bank performance is affected by intellectual capital but intellectual capital itself is very much sensitive to HCE which has main contribution in generating the value. The results are in line with studies reported by Chen *et al.* (2005), Ozkan *et al.* (2016) and Joshi *et al.* (2013). According to the results of the study, profitability of banks in Pakistan can be increased by efficiently utilizing their capital. By keeping focus on human capital, banks should also achieve structural as well as capital efficiency. As, this study mainly focused on banking sector in Pakistan, further studies can be carried out by analyzing other companies like, financial institutions, insurance companies, manufacturing companies,

service sector, etc by using other methods for calculating intellectual capital like Tobin's Ratio, balanced score card and market to book ratio.

### REFERENCES

- Al-Musalli, M.A.K. and K.N.I.K. Ismail, 2014. Intellectual capital and its effect on financial performance of banks: Evidence from Saudi Arabia. *Procedia Soc. Behav. Sci.*, 164: 201-207.
- Brooking, A., 1996. *Intellectual capital: Core asset for the third millennium enterprise* (1st edition). London: International Thomson Business Press, pp. 224.
- Çelikkol, H., 2008. Entelektüel Sermaye İlişkisinin İncelenmesine. In: R. Aşıkoğlu, M. Kurt and K. Ozcan (Eds.), *Entelektüel sermaye: Teori, uygulama ve yeni perspektifler*, Ankara: Gazi Kitabev, pp. 60-90.
- Chen, M.C., S.J. Cheng and Y. Hwang, 2005. An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance. *J. Intellect. Capital*, 6(2): 159-176.
- Chu, K.W.S., H. K. Chan and W.W.Y. Whu, 2011. *Charting intellectual capital performance of the*

- gateway to China. *J. Intellect. Capital*, 12(2): 249-276.
- Edvinsson, L., 1997. Developing intellectual capital at Skandia. *Long Range Plan*, 30(3): 320-373.
- Firer, S. and S.M. Williams, 2003. Intellectual capital and traditional measures of corporate performance. *J. Intellect. Capital*, 4(3): 348-360.
- Ghosh, A. and A. Mondal, 2009. Indian software and pharmaceutical sector and financial performance. *J. Intellect. Capital*, 10(3): 369-388
- Goh, P.C., 2005. Intellectual capital performance of commercial banks in Malaysia. *J. Intellect. Capital*, 6(3): 385-396.
- Isanzu, J.N., 2015. Impact of intellectual capital on financial performance of banks in Tanzania. *J. Int. Bus. Res. Mark.*, 1(1): 16-23.
- Itami, H., & T. W. Roehl., 1987. Mobilizing invisible assets. Cambridge, Mass.: Harvard University Press.
- Joshi, M., D. Cahill, J. Sidhu and M. Kansal, 2013. Intellectual capital and financial performance: An evaluation of the Australian financial sector. *J. Intellect. Capital*, 14(2): 264-285.
- Kamath, G.B., 2007. The intellectual capital performance of Indian banking sector. *J. Intellect. Capital*, 8(1): 96-123.
- Kaplan, R.S. and D.P. Norton, 1996. The balanced scorecard: Translating strategy into action. Boston: Harvard Business School Press.
- Karacan, S. and E. Ergin, 2011. Bankaların Entelektüel Sermayesi ile Finansal Performansı Arasındaki İlişki. *Bus. Econ. Res. J.*, 2(4): 73-88.
- Lipunga, A.M., 2014. A longitudinal assessment of intellectual capital of companies listed on Malawi Stock Exchange. *Eur. J. Bus. Manage.* 6(9): 27-35.
- Maditinos, D., D. Chatzoudes, C. Tsairidis and G. Theriou, 2011. The impact of intellectual capital on firms' market value and financial performance. *J. Intellect. Capital*, 12(1):132-151.
- Mondal, A. and S.K. Ghosh, 2012. Intellectual capital and financial performance of Indian banks. *J. Intellect. Capital*, 13(4): 515-530.
- Ozkan, N., S. Cakan and M. Kayacan, 2016. Intellectual capital and financial performance: A study of the Turkish banking sector. *Borsa Istanbul Rev.*, 20: 1-9.
- Pulic, A., 2004. Intellectual capital does it create or destroy value? *Meas. Bus. Excell.*, 8(1): 62-68.
- Pulic, A., 2000. VAIC<sup>TM</sup> – an accounting tool for IC management. *Int. J. Technol. Manage.*, 20(5/6/7/8): 702-714.
- Pulic, A., 1998. Measuring the performance of intellectual potential in knowledge economy. In: Paper presented at the 2nd McMaster World Congress on “Measuring and Managing Intellectual Capital” by the Austrian Team for Intellectual Potential.
- Roos, J., G. Roos, N.C. Dragonetti and L. Edvinsson, 1997. Intellectual capital: Navigating in the new business landscape. London: MacMillan Press.
- Samiloglu, A.T., 2006. The performance analysis of the Turkish banks through VAIC and MV/MB ratio. *J. Adm. Sci.*, 4(1): 207-226.
- Steward, T.A., 1991. Intellectual capital: Brainpower. *Fortune*, (June 3), p. 44.
- Steward, T.A., 1997. Intellectual capital: The new wealth of nations. New York: Doubleday Dell Publishing Group, Inc.
- Tan, H.P., D. Plowman and P. Hancock, 2007. Intellectual capital and financial returns of companies. *J. Intellect. Capital*, 8(1):76-94.
- Tsen, S. and H.L. Hu, 2010. A study of the organizational competitiveness and intellectual capital indicators of international tourist hotels. *Human Resource. Manage. Student Newspaper*, 10(1): 79-104.
- Yalama, A., 2013. The relationship between intellectual capital and banking performance in Turkey: Evidence from panel data. *Int. J. Learn. Intellect. Capital*, 10(1): 71-87.
- Yalama, A. and M. Coskun, 2007. Intellectual capital performance of quoted banks on the Istanbul Stock Exchange market. *J. Intellect. Capital*, 8(2): 256-227.
- Zehri, C., A. Abdelbaki and N. Bouabdellah, 2012. How intellectual capital affects firm's performance? *Aust. J. Bus. Manage. Res.*, 2(8): 24-31.