



## Impact of Intellectual Capital on Profitability - Conventional versus Islamic Banks

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### **Jel Classification**

G21, G34.

### **Abstract**

Intellectual capital has been found to have a significant association with profitability in the financial sector of various parts of the world. As a result, this study aims to empirically investigate the relationship between intellectual capital and financial performance of twenty-seven private commercial banks for the year 2013 in Bangladesh. Annual reports for the relevant year of the selected banks have been used to gather secondary information for the empirical models based on Pulic's VAIC model. Stepwise regression was performed for the full sample, conventional and Islamic banks separately. The analysis indicates that both VIAC and its components have a significant association with profitability. Results for conventional and Islamic banks established different components of VIAC as a significant predictor of bank's profitability. A future study including all financial institutions could provide a better estimate of the impact of intellectual capital on profitability for the finance sector.

## **1. Introduction**

In a knowledge-intensive economy, a company's intellectual capital, whether it is derived from its employees, customer databases or brands, undoubtedly contribute to a company's success and its ultimate value. Most of these intangible assets cannot be included within a company's statement of financial position and intellectual capital disclosures in the annual report, and financial statements have been largely voluntary. For many firms in this modern economy, intellectual, not physical capital is their most important asset. Marr, B., and Schiuma (2001) argue that a firm's value is often partly based on the intangible intellectual capital (IC) that it possesses.

Although Bangladesh is not a knowledge-based economy, there are many driving forces, such as globalisation, increased use of information technology and appearance of new media speeding up Bangladesh towards a knowledge-based economy. The concept of IC is a new concept in Bangladesh. As such, there is no legislative guideline for IC disclosure in Bangladesh including the Companies Act 1994. Bangladesh Accounting Standards 1 (BAS1) encourages the listed companies to make the disclosures of non-financial activities. Therefore, intellectual capital disclosure in Bangladesh is still voluntary. Management makes voluntary IC disclosure as long as there is a marginal benefit to be gained from reducing the information asymmetry in the market (Abhayawansa and Abeysekera, 2009).

Although some companies in Bangladesh make such disclosure, these are not in an organised format. Further, companies do not address the eco-justice issues like child labour, equal opportunity and poverty alleviation due to fear of bad publicity and counting the cost (Belal and Cooper, 2007). As a result, this study has aimed at determining the impact of intellectual capital on financial performance among banking sector in Bangladesh. The paper is organised into three sections. In the first section, intellectual capital is briefly discussed along with the review of the literature focusing on the association between intellectual capital and profitability. Several hypotheses were developed based on the findings of prior literature and the detailed discussions of the methodologies of testing those hypotheses are discussed in the second section of the paper. In the final section, statistical results are provided along with discussion and concluding remarks.

## **2. Intellectual Capital**

The concept of intellectual capital emerged following the 'resource-based view theory (Barney; Peteraf) and 'knowledge-based view theory' arguing essentially that success of a company is attributable to its intangible assets. It is defined as, the intellectual, or knowledge-based, resources of an organisation (Striukova, L., Unerman, J. and Guthrie). A wide range of definitions is available for intellectual capital. CIMA (2001) and Marr, B., and Schiuma (2001) probably provide the most comprehensive definitions when they define intellectual capital as:

*...the possession of knowledge and experience, professional knowledge and skill, good relationships, and technological capacities, which when applied will give organisations a competitive advantage. (CIMA)*

*...the group of knowledge assets that are attributed to an organisation and most significantly contribute to an improved competitive position of this organisation by adding value to defined key stakeholders. (Marr, B., and Schiuma, 2001)*

A key feature of the definition of intellectual capital is that they recognise the link between intellectual capital and the structure and performance of an organisation. They reflect the uniqueness of intellectual capital to individual firms in enhancing their competitive advantage. IFRS (International Financial Reporting Standards) Committee developed the IAS 38 with the process of prescribing the accounting treatment for intangible assets. Here intangible asset as an identifiable non-monetary asset without physical substance.

VAIC™ an Austrian approach is one of the important and consistent approaches for measuring the IC's performance of insurance sector. This approach is an alternative to traditional approaches in which IC performance is based on assets, net profit and shareholder equity. Many researchers, practitioners, and academicians have used this approach in their research work. According to Pulic, intellectual capital is normally classified as human capital, structural capital and capital employed (Pulic, "Measuring the Performance of Intellectual Potential in Knowledge Economy"). Human capital is the value that the employees of business provide the application of skills, know-how, and expertise. Human capital is an organisation's human capability for solving business problems and exploiting its intellectual property capital is inherent in people and cannot be owned by an organisation. Therefore, human capital can leave an organisation when people leave and if management has failed to provide when others can pick up their know-how (Pulic, "Value Creation Efficiency Analysis of Croatian Banks 1996-2000"). Human capital also encompasses how effectively an organisation uses its people, resources as measured by creativity and innovation.

Structural Capital is the supportive non-physical infrastructure, processing databases of the organisation that enables human capital to function. Structural capital includes patents, trademarks as well as the organisation's image, organisations information system, proprietary software, and databases. Because of its diverse components, structural capital can be further classified into the organisation, process, and intellectual capital. Organisational capital includes the organisation philosophy and systems for organisations capability. Process Capital includes the techniques, procedures that include the techniques, procedures that implement and enhance the delivery of goods and services. Innovation includes intellectual property such as patents, trademarks, copyrights, etc. Intellectual properties are protected commercial rights such as

patents, trade secrets, trademarks. Intangible assets are all of the other talents and theory by which an organisation can operate.

The value of intangible assets within organisations such as human and intellectual capital has increased significantly in recent years as the global economy has become more knowledge intensive. Human and intellectual capital forms a significant part of the competitive advantage of twenty-first-century organisations and yet remains out of view among stakeholders. Given the nature of the intangible assets involved, it is difficult for businesses and their stakeholders to properly assess organisations effectiveness regarding creating, transferring and deploying knowledge. The lack of visibility coupled with an unstable and uncertain economic environment can make it nearly impossible for organisations to articulate their true potential for creating long term value.

But intellectual capital and intangible assets, in general, pose real challenges for government, regulators and firms. A key challenge is the need to identify a theoretical and practical solution to the recognition, measurement and reporting of intangible assets processes and potentials. Information on a firm's human resources, innovation, customers or technology cannot be included in financial statements because of identification, recognition and measurement problems.

Capital employed is defined as all resources linked to the external relationships of the firm – with customers, suppliers or partners in research and development (Kiong and Lean). This component of intellectual capital can be viewed from two angles. If it is seen from funding side, capital employed becomes equal to equity capital with additional load capital. While viewed from an asset side, it becomes equal to a fixed asset with an additional working capital. Capital employed comprises part of human and structural capital involved with a company's relations with stakeholders, plus the perceptions that they hold about the company (Belkaoui). Examples of capital employed include an image, customer loyalty, environmental activities and customer satisfaction.

### **3. Literature Review**

Academicians and practitioners are very much concern about the strategic importance of IC, and they all believe that IC becomes a vital corporate asset that impacts on long-run business performance. The impact of IC on organisational performance is being studied over the last decade, but it is quite vital that the impact of IC on firm performance is not direct. Therefore, it is important to examine the link between IC and organisational performance. The empirical examination of the said relationship is particularly important in the banking sector because the said sector is a knowledge-intensive sector (Mavridis).

Acting as a financial intermediary, the bank provides essential services in stimulating economic growth (Goh). As the economic growth of a country is influenced by the performance of the banks

and the performance of other business organisations of an economy dependent upon the service provided by the banking sector, that is why it is important to examine to what extent banks are capable of utilising the intangible or intellectual assets. Although the importance of IC is constantly increasing, many organisations face problems with its management, mostly due to measurement difficulties (Andrikopoulos, 2005; Kim, Kumar, and Kumar, 2009; Nazari and Herremans, 2007). Huang (2007) signified intellectual capital to the summation of all knowledge and capabilities of every employee that brings about performance and creates wealth for the consulting firms. Lonnqvist, Kianto and Sillanpaa (2009) also examined that the role of intellectual capital management in ensuring the alignment of the change content with the strategic goals of the organisation

Financial institutions play a crucial role in the economy where it allows transfer of funds from surplus spending units to deficit spending units in the most efficient manner. Traditionally, a company is considered as having a competitive advantage if it can produce the same or similar product at a lower cost. Thus, competitive advantage can be defined as having lower cost, which makes the company enjoy a higher profit margin. According to Hazlina, H. and Zubaidah (2008), IC is considered as a source of competitive advantage, which can increase the profit of a company. Internationally, the banking and finance sector has been a focus for many VAIC studies. Mohiuddin, Najibullah and Shahid (2006) examined the IC performance from 2002 to 2004 of 17 commercial banks in Bangladesh. Their key finding was that all the banks in the study had higher HCE than other capital efficiencies. According to Tarawneh (2006) in his article regarding financial performance in Oman banking sector, it shows that not all banks that have high total capitals, deposits, credits or even total assets would indicate that the banks always had better profitability. The situation that is caused by current competition that intensely effect on banking performance.

Peng, Pike, and Roos (2007) found that the critical intellectual capital elements and performance indicators regarded as important for performance management practices in the Taiwanese hospital industry were identified. They reveal the relative importance and ranking of human, organisational and relational capitals, and performance indicators.

Another study of Tovstiga, G., and Tulugurova (2007) found that intellectual capital, particularly structural and human capital, is perceived by Russian managers of SIEs to be a primary determinant of enterprise performance, thereby substantiating the importance of the resource-based view of enterprise performance – even in the transitional economy of Russia.

Muhammad & Ismail (2009) analyse the impact of intellectual capital efficiency on firms financial performance and find that VAIC™ has a positive and substantial relationship with financial performance and profitability of Malaysian financial sector. HCE (Human Capital Efficiency) and

SCE (Structural Capital Efficiency) do not have a positive relationship with financial performance and profitability except CEE (Capital Employed Efficiency).

Kamukama, Ahiauzu, and Ntayi (2010) did research in Uganda and concluded that the magnitude effect of human capital on performance depends on any of structural or relational capital. However, no significant interaction effects were established between relational and structural capital. Clarke, Seng, & Whiting (2011) made a study of 2,161 firms listed on the Australian Stock Exchange from 2003 to the 2008 financial year. They found that there was a direct relationship between VAIC and performance of Australian publicly listed firms, particularly with CEE and to a lesser extent with HCE.

A positive relationship between HCE and SCE in the prior year and performance in the current year was also found. However, evidence also suggests the possibility of an alternative moderating relationship between the IC components of HCE and SCE with physical and financial capital (CEE) which impacts on firm performance.

Mondal & Ghosh (2012) conducted a research of a sample of 65 Indian banks. Overall empirical findings, which are based on multiple regression analysis between IC performance and conventional corporate financial performance measures, clearly indicate that IC is an important determinant of the bank's profitability and productivity. But when the measure of IC is classified into major components, the efficiency of HC (Human Capital) plays major roles in enhancing the returns of banks. This suggests that an increase in HC investment enhances the bank's financial performance.

Uddin (2015) made a study to explore the relationship between investment in human resources and corporate financial performance during 2011- 2014. This study revealed that human resources had made a substantial contribution to achieving the financial goal of Islamic Banks in Bangladesh. The study experienced that Islamic Banks came into existence in an environment where the laws, institutions training & attitude are set to serve an economy based on the principles of interest

In recent years, financial institutions, especially those in the banking industry, have experienced a dynamic and competitive environment. Competition on a cross-border scale compels local banks to adjust their competitive position by achieving sustainable financial performance. The banking industry is one of the most knowledge-intensive industries. The present study is a modest attempt to examine whether conventional performance measures of Islamic and Conventional Banks capture the IC performance or not.

#### **4. Hypothesis Development**

Intellectual capital is often viewed as a strategic resource that could enable a firm to gain competitive advantage and improve performance. Using VAIC as a measure of IC, Mavridis (2004)

have found positive association which is supported by the findings of Shiu (2006) who showed that the VAIC has a significantly positive correlation with the profitability and market valuation but negative correlation with productivity in Taiwan.

The impact of intellectual capital on firm performance has been studied by many authors. Ting and Lean (2009) examined the relationship between VAIC and financial performance over the period of 1999 to 2007 for Malaysian financial sector and found a positive association. Zéghal and Maaloul (2010) also found VAIC to have a significant positive relationship with firm performance. Several studies looked into the impact of VAIC components on firm performance. Goh (2005) found Investment in Human Capital (HC) yields a higher return than the investment in SC for Commercial Banks in Malaysia. Bontis et al. (2000) however, found a positive relationship between financial performance and Structural Capital (SC).

The study conducted by Saengchan (2008) has confirmed that IC acts as an important source of the corporate advantage of Thai banks as the efficiency of IC is found to have a strong association with the profitability of banks. Mondal & Ghosh (2012) conducted a study on 65 Indian banks for ten years and found that the relationships between the performance of a bank's intellectual capital and financial performance indicators are varied. Findings of Mondal & Ghosh (2012) are justified by Puntilo (2009) as the study revealed a non-significant association between VAIC and firm performance. Hence, the following hypothesis has been formulated:

*H1: VAIC is positively related to profitability.*

Again the components of VIAC were identified to have a positive influence on firm performance. For instance, Joshi and Sidhu (2010) determined that HCE has a positive impact on the performance of Australian Owned Banks for the period of 2005 to 2007. Bontis et al. (2000) have found a positive relationship between SCE and firm performance. Muhammad and Ismail (2009) found that VAIC has a significant relationship with firm performance in the Malaysian financial sector while the only CEE has a positive influence on performance. The study of Mondal & Ghosh (2012) on the other hand found a non-significant association among ROA, ROE, and HCE; ROA, ROE and SCE for Indian banking industry for a ten year period. Hence, the following hypothesis has been formulated:

*H<sub>2b</sub>: HCE is positively related to profitability.*

*H<sub>2c</sub>: SCE is positively related to profitability.*

CEE is found to have a significant positive relationship with at least one measure of return in the study of (Zéghal et al.). Although there is evidence of VIAC to affect performance, the majority of these results are drawn from studies conducted in developed countries while the potential of

intellectual capital in improving firm's performance is left unexplored. In the context of a developing country like Bangladesh, little evidence exists for proving the influence of IC on firm performance. Najibullah (2005) suggested that bank's market value is positively associated with the corporate intellectual ability and its three components i.e. HCE, SCE and CEE in Bangladesh. However, these results do not provide conclusive evidence as the financial sector in the country has grown and is affected by adverse economic and political scenarios till 2005. Therefore, the following relationships are hypothesised:

*H<sub>2c</sub>: CEE is positively related to profitability.*

## **5. Data and Methodology**

### **5.1 Source of Data**

The data used in this paper were collected from the annual reports of 27 bank (see Table – 6 in Appendix) listed on the Dhaka Stock Exchange (DSE). The companies were limited to one sector as to obtain a homogeneous sample. As of June 2016, there were 56 scheduled banks in Bangladesh. Six state-owned commercial banks, two specialised banks and nine foreign commercial banks were not considered in the current study. As a result, the final population of the study became thirty-nine private commercial banks including thirty-one conventional and eight Islamic banks. Data related to dependent and independent variables were collected from the annual reports of the year 2013. As a result, twelve commercial banks were not considered in the study as nine of them were established in 2013, and the annual reports were not available for the rest three banks. The final sample represents forty-eight percent of the population which is a good representative of the banking sector in Bangladesh.

### **5.2 Measurement of the variables**

#### ***Dependent variable***

Profitability can be measured in a variety of ways. Prior studies have used Return on Asset (ROA), Return on Equity (ROE) for measures of profitability (Chen, Cheng, and Hwang; Chan). This study uses both measures of financial performance defined as follows:

- 1) Return on assets (ROA) = Profit before tax / Average total assets
- 2) Return on equity (ROE) = Profit before tax / Average common stock equity

#### ***Independent variables***

VAIC and its three components, HCE, SCE, and CEE, are independent variables of this study. VAIC is calculated through VA which in its simplest form is the difference between input and output. VA is also defined as the net value created by firms during the year (Chen, Cheng, and Hwang), and can be expressed as follows:

$$VA = NI + T + DP + W$$



Where NI is the net income after tax; T is taxed; DP is depreciation and W is employee wages and salaries.

*Human Capital Efficiency:* Human Capital (HC) is defined as salaries and wages at a point in time (Pulic, "Measuring the Performance of Intellectual Potential in Knowledge Economy"). It is calculated as:

$$HCE = VA / HC$$

A low salary and high VA will result in an inefficient HC according to above formula of HCE.

*Structural Capital Efficiency:* Structural capital (SC) includes IC items such as strategy, organisational networks, patents and brand names. Pulic (1998) calculated SC as:

$$SCE = SC/VA$$

$$SC = VA - HC$$

*Capital Employed Efficiency:* Pulic (1998) argues that IC cannot create value on its own, and so it must be combined with capital (physical and financial) employed (CE). CEE is calculated by the following formula:

$$CEE = VA / CE$$

*Value Added Intellectual Capital:* All three components of intellectual capital are then combined to create the following index to measure VAIC:

$$VAIC = HCE + SCE + CEE$$

*Control Variables:* Two variables are included in the current measurement model to minimise the impact of another variable that explains observed relationships with firm performance.

1. Leverage = Total debt / Total assets
2. Size = Logged Total Asset

### 5.3 Empirical Models

Following Pulic (2001), models of this study are as follows:

$$ROA_{it} = \beta_0 + \beta_1 VAIC + \beta_2 Control\ Variables_{it} + \epsilon_{it}$$

$$ROA_{it} = \beta_0 + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + \beta_4 Control\ Variables_{it} + \epsilon_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 VAIC + \beta_2 Control\ Variables_{it} + \epsilon_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + \beta_4 Control\ Variables_{it} + \epsilon_{it}$$

Here, ROA and ROE represents the profitability of the bank, and the independent variables are both VAIC and the components of VAIC including human capital efficiency (HCE), structural capital efficiency (SCE) and capital employed Efficiency (CEE). HCE is the indicator of the value added (VA) efficiency of human capital whereas SCE is the indicator of the VA efficiency of structural capital and CEE is the indicator of the VA efficiency of capital employed. The model also includes control variables such as leverage and size.

## 6. Results

### 6.1 Descriptive Statistics

Table 1 provides the descriptive statistics of chosen sample. ROA and ROE represent profitability that is considered as a dependent variable in the empirical model of intellectual capital. Standard deviation score is low for both ROA and ROE, which indicates toward a similar profitability scenario among the twenty-seven banks. It provides a unique opportunity to explore the impact of intellectual capital on the financial performance of the banks having a homogeneous profitability positions. Among the VAIC components, HCE has the highest standard deviation score indicating a difference in human capital efficiency across the sample banks.

Table 1: Descriptive Statistics

	Mean	Median	Std. Deviation	Variance	Skewness	Kurtosis
ROA	0.016	0.019	0.014	0.000	-3.651	16.453
ROE	0.213	0.233	0.072	0.005	-0.530	-0.811
HCE	2.729	2.711	1.152	1.327	-0.519	6.410
SCE	0.674	0.642	0.258	0.066	4.143	19.805
CEE	0.030	0.032	0.013	0.000	-2.454	9.220
VAIC	3.433	3.369	1.087	1.182	0.736	4.179
Leverage	1.075	1.091	0.091	0.008	-4.612	22.988
Size	25.770	25.811	0.588	0.345	-2.322	10.908

### 6.2 Correlation Analysis

Pearson correlation analysis was conducted to check for homogeneity issues. The correlation results provided in Table 2 indicated statistically significant correlations among all variables except between VAIC and SCE, ROA and SCE, SCE and ROE, SIZE and ROE and Leverage and ROE. Correlation plays a strong influence in regression analysis, and the current results are expected to make its impact on the ROE model. None of the VIAC components was found to have strong significant (>.90) correlations with each other, proving that the model does not suffer for homogeneity issues.

Table 2: Correlation Analysis among Variables

	ROA	ROE	HCE	SCE	CEE	VAIC	Leverage	Size
ROA	1							
ROE	.667**	1						
HCE	.846**	.611**	1					
SCE	-.707**	-.159	-.384*	1				
CEE	.933**	.720**	.689**	-.650**	1			
VAIC	.740**	.618**	.977**	-.177	.587**	1		
Leverage	.891**	.293	.693**	-.888**	.795**	.533**	1	
Size	.692**	.180	.531**	-.796**	.601**	.381*	.810**	1

\*\*sig<.01, \*sig<.05

### 6.3 Regression Analysis

Table 3 contains the stepwise regression results of all twenty-seven banks for the year 2013. The empirical results show that independent variables in Model 1 collectively explain 88.4 and 35.7 percent of the variance in ROA and ROE respectively. The lower value of the adjusted R<sup>2</sup> can be explained by the non-significant correlations among few variables as explained earlier. From the Table 3, it may be observed that VAIC has a significant positive influence on bank's profitability while measuring by both ROA a ROA. Among the two control variables, only leverage was found to have a significant positive impact on profitability measured by ROA.

In model 2, the association between components of VAIC and profitability has been measured. The empirical results show that HCE and banks profitability as measured by ROA and ROE are almost significantly and positively related. Similar results are found for the impact of CEE on ROA and ROE. But, SCE is found to have a significant negative association on ROA and ROE. Structural capital is the least important components as compared to human and physical capital. Among the control variables, leverage has a significant association with ROA in Model 2

Table 3: Regression Results (Full Sample)

Independent Variables	Dependent Variables			
	ROA		ROE	
	Coefficients	t-Statistics	Coefficients	t-Statistics
<b>Model 1</b>				
Constant	-.115	-9.924**	.073	1.963**
VAIC	.005	4.683**	.041	3.932**
Leverage	.107	8.780**	-.052	-.273
Size	-.035	-2.960	-.064	-.372
Adjusted R <sup>2</sup>		0.884		0.357
F-value		99.844**		15.460*
<b>Model 2</b>				
Constant	-.006	-2.433*	1.505	5.889**
HCE	.005	9.507**	.049	5.563**
SCE	-.012	9.477**	-.189	-3.167*
CEE	.552	9.507**	6.352	9.186**
Leverage		.127	-1.383	-6.204**
Size		-.021	-.118	-.194
Adjusted R <sup>2</sup>		0.974		0.872
F-Value		328.691**		44.324**

\*\*sig<.01, \*sig<.05

The empirical model is further analysed for conventional and Islamic banks separately to determine any difference in the results that might arise from the difference in their operations. Table 4 provides regression results of twenty conventional banks for the year 2013. In the first model, the influence of VIAC on firm performance as measured by ROA and ROE is found to be positive. VAIC along with control variables is found to explain 54.4 and 42.4 percent of the variation in ROA and ROE respectively. In Model 2, only SCE and CEE have a significant positive

influence on profitability measured by ROA and ROE. HCE, on the other hand, found to have a non-significant influence on both measures of profitability for only conventional banks which had a positive influence on the total sample.

Table 4: Regression Results (Conventional Banks)

Independent Variables	Dependent Variables			
	ROA		ROE	
	Coefficients	t-Statistics	Coefficients	t-Statistics
<b>Model 1</b>				
Constant	.002	.566	1.670	3.185*
VAIC	.005	4.637**	.040	3.276*
Leverage	-.011	-.065	-1.451	-2.983*
Size	-.056	-.335	-.054	-.288
Adjusted R <sup>2</sup>		0.544		.424
F-value		21.504**		7.995*
<b>Model 2</b>				
Constant	-.022	-8.756**	1.341	7.428**
HCE	.057	.700	.105	.646
SCE	.041	9.835**	.287	5.916**
CEE	.452	9.267**	5.664	10.032**
Leverage	.037	.638	-1.357	-8.151**
Size	-.007	-.123	-.014	-.214
Adjusted R <sup>2</sup>		0.946		0.941
F-Value		149.503**		85.420**

\*\*sig<.01, \*sig<.05

Finally, regression analysis is conducted on the seven Islamic banks, and Table 5 indicates several differences in the results as compared to the regression results of Table 3 and 4. In Model 1, VAIC is found to have a positive association with profitability as usual, but the degree of influence is higher as compared to the full sample and conventional banks only. The adjusted R<sup>2</sup> is highest indicating that VAIC can explain 99.1 and 76.4 percent of variations in ROA and ROE respectively in cases of Islamic Banks in Bangladesh. Table 5 provides a different picture for Islamic banks. While SCE and CEE were found to have the most significant association with both ROA and ROE, only HCE has a positive association with ROE and CEE has the most significant positive association with ROA. SCE has no association with any of the measures of profitability. The adjusted R<sup>2</sup> values of model 2 also justify the strength of the model in explaining the impact of VAIC components on profitability for Islamic banks which was lower in the case of conventional banks.

Table 5: Regression Results (Islamic Banks)

Independent Variables	Dependent Variables			
	ROA		ROE	
	Coefficients	t-Statistics	Coefficients	t-Statistics
<b>Model 1</b>				
Constant	-.116	-17.071**	.016	.412
VAIC	.007	5.073**	.056	4.525**
Leverage	.101	10.868**	-.388	-1.174
Size	-.056	-4.85	-.235	-.964
Adjusted R <sup>2</sup>		0.991		0.764
F-value		350.195**		20.476*
<b>Model 2</b>				
Constant	-.019	-8.907*	.095	3.097*
HCE	.335	2.093	.041	3.488*
SCE	-.139	-.961	.621	1.670
CEE	1.259	16.140**	-.979	-1.276
Leverage	.330	1.614	-1.114	-2.775
Size	.049	.431	-.525	-1.825
Adjusted R <sup>2</sup>		0.977		0.650
F-Value		260.491**		12.166*

\*\*sig<.01, \*sig<.05

## 7. Discussions

The regression results provided in Table 3, 4 and 5 indicates that the model developed based on the Pulic's Intellectual Capital components are significant for the banking sector in Bangladesh. Value Added Intellectual Capital (VAIC) is proved to be a strong predictor of bank's profitability (both conventional and Islamic Banks). In all cases, VAIC has a positive effect on bank's profitability which is slightly higher for Islamic Banks ( $\beta = .007$  for ROA and  $.56$  for ROE) as compared to conventional banks ( $\beta = .005$  for ROA and  $.40$  for ROE) and the banking industry ( $\beta = .005$  for ROA and  $.41$  for ROE). In other words, an increase in VAIC by one Taka would result in an increase in ROA by  $.007$  Taka and ROE by  $.56$  Taka for Islamic banks. As a result, hypothesis 1 is accepted.

Components of the VAIC model were empirically tested to determine their influence on the Bank's profitability in Bangladesh. Mixed results were found from the results provided in Table 3, 4 and 5. While HCE was found to have a positive influence on each component of profitability ( $\beta = .005$  for ROA and  $.49$  for ROE) for the banking industry, it became insignificant for the conventional banks. But in the case of Islamic banks, HCE was found to have a positive association with ROE only ( $\beta = .041$ ). As a result, hypothesis 2a is accepted.

The second component of VIAC is SCE. Regression results in Table 3, 4 and 5 indicates that SCE has a significant negative association with profitability in case of the banking sector ( $\beta = -.012$  for ROA and  $-.189$  for ROE). In the case of Islamic banks, SCE is not found to be a significant predictor of profitability. Again, SCE became a significant positive predictor of ROE for conventional banks

( $\beta = .041$  for ROA and  $.287$  for ROE). These mixed results could not allow us to accept the associated hypothesis. As a result, hypothesis 2b is rejected.

The final hypothesis of the study was formulated to examine the possibility of a positive association between CEE and bank's profitability. Table 3 provides strong support for the hypothesis as CEE is found to have a significant positive association with both predictors of profitability ( $\beta = .552$  for ROA and  $6.352$  for ROE). Table 4 provides the segment analysis for conventional banks only, and we can see the similar results as compared to the whole banking industry ( $\beta = .452$  for ROA and  $5.664$  for ROE). But, regression results for Islamic banks provided in Table 5 shows a different scenario. CEE has a significant positive association with ROE ( $\beta = 1.259$ ) while a non-significant association with ROE is also found. But, these results give us enough evidence to support Hypothesis 2c. As a result, hypothesis 23 is accepted.

Two control variables have also been used in both models of intellectual capital. Between the two control variables, only leverage had a negative association with ROE for the banking industry and conventional banks only while size failed to prove its association with any of the predictors of Bank's profitability.

## **8. Conclusion**

This study focused on investigating the impact of intellectual capital on profitability among commercial banks operating in Bangladesh. Therefore, Public's VAIC model was used to measure intellectual capital for banks, and profitability was measured using ROA and ROE. The present study was conducted on data from a sample of 27 banks. Overall empirical findings, which are based on stepwise multiple regression analysis between IC performance and bank's profitability, clearly indicate that IC is an important determinant of bank's profitability in Bangladesh. It provides a significant contribution to the existing literature of intellectual capital and increases the generalizability of Pulic's Value Added Intellectual Capital (VAIC) model in the context of a developing country. The impact of value creation factors on financial performance is proven through statistical results. Among the components of intellectual capital, CEE has the highest influence on profitability among commercial banks. The performance of various components of VAIC and the overall VIAC score differed between conventional and Islamic banks. Efficiency in capital investment measured through CEE was found to be the most significant predictor of profitability for Islamic Banks. In the case of conventional banks, efficiency in structural capital investment was found to have a higher impact on profitability while CEE was established as a significant predictor of profitability. HCE was found significant while the entire sample was considered. The main limitation of this study is the sample size. Data including all 56 scheduled banks in Bangladesh would provide a more accurate picture of the impact of IC performance on profitability. By including seven Islamic banks out of eight and providing a comparative analysis of conventional and Islamic banks, the study has tried to minimise the drawback of the small

sample size. However, results obtained in the current study clearly establish the importance of IC performance for the banking sector in Bangladesh. Therefore, the findings of the study could be helpful for stakeholders of the banking industry in realising the true potential of intellectual capital for its sustainable growth.

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## Appendix

Table 6: VAIC and component scores of Conventional and Islamic Banks in Bangladesh

Bank name	HCE	SCE	CEE	VAIC
<b>Conventional</b>				
AB Bank Limited	2.71	0.63	0.03	3.37
Bank Asia Limited	3.61	0.72	0.03	4.37
Brac Bank Limited	2.55	0.61	0.04	3.2
The City Bank Limited	1.84	0.46	0.03	2.32
Dutch Bangla Bank Limited	2.38	0.58	0.05	3.01
Dhaka Bank Limited	3.22	0.69	0.03	3.95
Eastern Bank Limited	3.69	0.73	0.05	4.46
IFIC Bank Limited	2.61	0.62	0.04	3.27
Mercantile Bank Limited	3.43	0.71	0.03	4.17
Mutual Trust Bank Limited	2.34	0.57	0.03	2.94
National Bank Limited	2.86	0.65	0.03	3.54
NCC Bank Limited	3.01	0.67	0.03	3.71
Prime Bank Limited	2.38	0.58	0.03	2.99
Pubali Bank Limited	2.99	0.67	0.04	3.69
Rupali Bank Limited	1.89	0.47	0.02	2.37
Southeast Bank Limited	6.08	0.84	0.04	6.95
Standard Bank Limited	3.46	0.71	0.03	4.2
Trust Bank Limited	2.15	0.54	0.02	2.71
United Commercial Bank Limited	3.18	0.69	0.04	3.91
Uttara Bank Limited	2.12	0.53	0.04	2.69
<b>Islamic</b>				
Al Arafah Islami Bank Limited	3.85	0.74	0.04	4.63
Exim Bank Limited	2.93	0.66	0.03	3.62
First Security Islami Bank Limited	2.54	0.61	0.02	3.17
ICB Islami Bank Limited	-1.14	1.88	-0.02	0.72
Islami Bank Bangladesh Limited	1.77	0.43	0.02	2.23
Shahajalal Islami Bank Limited	2.8	0.64	0.03	3.47
Social Islami Bank Limited	2.46	0.59	0.03	3.08